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Vol. 1054 Number 4

OFFICIAL GAZETTE

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UNITED STATES PATENT AND TRADEMARK OFFICE

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PATENTS

May 28, 1985

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

May 28, 1985 Volume 1054 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of May 7, 1985 and was published in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

International PCT fees were changed effective May 28, 1985 and were announced in the *Official Gazette* at 1053 O.G. 42 on Apr. 16, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International fees	
Basic fee (first 30 pages)	230.00
Basic Supplemental fee (for each page over 30)	4.00
Designation fee (for the first 10 national or regional offices)	55.00
Designation fee for 11th and subsequent designations	No charge

May 7, 1985.

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on May 25, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,330,887 through 4,332,032

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Board of Appeals Decisions Rendered in the Month of Apr. 1985

Affirmed	183
Affirmed in Part	27
Reversed	94
Total	304

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

3,997,241, Re. S.N. 711,820, Filed Mar. 14, 1985, Cl. 350/96.33, OPTICAL WAVEGUIDE TRANSMITTING LIGHT WAVE ENERGY IN SINGLE

MODE, Shigeo Nishida, et al., Owner of Record: *50% to Hitachi, Ltd., Tokyo, Japan, 50% to Shojiro Kawakami, Sendai-Shi, Japan,* Attorney or Agent: Donald R. Antonelli, et al., Ex. Gp.: 251

4,027,171, Re. S.N. 699,350, Filed Feb. 8, 1985, Cl. 307/039, POWER DEMAND LIMITING SYSTEM, Joe B. Browder, et al., Owner of Record: *Assors. by direct and mesne assights. of 45% to Joe B. Browder; 5% to Walter R. Hensley; 45% to M.R.C. Realty , Inc. and 5¼% collectivley to Edward Taylor Newton, George M. Hopkins, et al., Atlanta, Ga.,* Attorney or Agent: George M. Hopkins, et al., Ex. Gp.: 214

4,053,301, Re. S.N. 719,967, Filed Apr. 2, 1985, Cl. 075/011, PROCESS FOR THE DIRECT PRODUCTION OF STEEL, Frank M. Stephens, Owner of Record: *Hazen Research, Inc., Golden, Colo.,* Attorney or Agent: Philip H. Sheridan, et al., Ex. Gp.: 111

4,356,268, Re. S.N. 665,396, Filed Oct. 26, 1984, Cl. 210/611, METHOD FOR TREATING WASTE WATER, Norio Shimizu, et al., Owner of Record: *Hitachi, Ltd., Tokyo, Japan,* Attorney or Agent: Thomas E. Beall, Jr., et al., Ex. Gp.: 136

4,372,705, Re. S.N. 699,698, Filed Feb. 8, 1985, Cl. 405/019, ARTICULATED EROSION CONTROL SYSTEM, Francis S. Atkinson, Owner of Record: *Inventor,* Attorney or Agent: Paul E. Krieger, et al., Ex. Gp.: 351

4,384,301, Re. S.N. 716,293, Filed Mar. 26, 1985, Cl. 357/23.3, HIGH PERFORMANCE SUBMICRON METAL-OXIDE-SEMICONDUCTOR FIELD EFFECT TRANSISTOR DEVICE STRUCTURE, Alf. Tasch, Jr., Pallab K. Chatterjee, et al., Owner of Record: *Texas Instruments, Inc., Dallas, Tex.,* Attorney or Agent: Douglas A. Sorensen, et al., Ex. Gp.: 253

4,436,376, Re. S.N. 710,846, Filed Mar. 12, 1985, Cl. 350/332, LIGHT MODULATOR, EMODULATOR AND METHOD OF COMMUNICATION EMPLOYING THE SAME, James L. Fergason, Owner of Record: *Inventor,* Attorney or Agent: Thomas H. Murray, et al., Ex. Gp.: 257

4,440,746, Re. S.N. 716,051, Filed Mar. 26, 1985, Cl. 424/078, GRANULAR PESTICIDE COMPOSITION, Michael J. Maglio, Owner of Record: *Pennwalt Corp., Philadelphia, Pa.,* Attorney or Agent: David Edwards, Ex. Gp.: 125

4,457,504, Re. S.N. 718,467, Filed Apr. 1, 1985, Cl. 269/296, COLLAPSIBLE/KNOCKDOWN SAWBUCK, Gilbert E. Mottla, Owner of Record: *Inventor,* Attorney or Agent: David S. Fishman, et al., Ex. Gp.: 323

4,458,318, Re. S.N. 720,327, Filed Apr. 5, 1985, Cl. 364/424.1, CONTROL ARRANGEMENT FOR A VARIABLE PULLEY TRANSMISSION, Jeoffrey N. Smit, et al., Owner of Record: *Borg-Warner Corp., Chicago, Ill.,* Attorney or Agent: Florian Gregorczyk, et al., Ex. Gp.: 237

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,500,938, Reexam. No. 90/000,768, Requested: Apr. 26, 1985, Cl. 173/40, UNIVERSALLY MOUNTED DRILLING MAST, John V. Watson, Owner of Record: *Watson Manufacturing Co., Fort Worth, Tex.,* Attorney or Agent: Wofford & Felsman, Ex. Gp.: 324, Requester: Jerry D. Wilkinson, Perris, Calif.

3,781,853, Reexam. No. 90/000,764, Requested: Apr. 24, 1985, Cl. 340/985, NAVIGATIONAL LIGHT SYSTEM, Thomas A. Jacobs, Owner of Record: *Tideland Signal Corp., Houston, Tex.,* Attorney or Agent: James F. Weiler, Ex. Gp.: 264, Requester: Automatic Power, Inc., Philadelphia, Pa.

4,140,387, Reexam. No. 90/000,769, Requested: Apr. 30, 1985, Cl. 355/14, APPARATUS FOR PRODUCING COLLATED COPIES FROM TWO SIDED ORIGINALS, Gary B. Gustafson, Owner of Record: *Eastman Kodak Co., Rochester, N.Y.,* Attorney or Agent: Paul R. Holmes, Ex. Gp.: 210, Requester: Boris Haskell, Arlington, Va.

4,141,973, Reexam. No. 90/000,770, Requested: Apr. 30, 1985, Cl. 514/54, ULTRAPURE HYALURANIC ACID AND THE USE THEREOF, Endre A. Balazs, Owner of Record: *Biotrics, Inc., Riverside, N.Y.,* Attorney or Agent: Sheldon Palmer, Ex. Gp.: 125, Requester: Roland T. Bryan, Stamford, Conn.

4,212,088, Reexam. No. 90/000,763, Requested: Apr. 22, 1985, Cl. 4/49, APPARATUS FOR CLEANING SWIMMING POOLS, John M. Goettl, et al., Owner of Record: *George J. Ghiz, Phoenix, Ariz.,* Attorney or Agent: Cahill, Sutton, et al., Ex. Gp.: 240, Requester: Aquarian Age Pools, Inc., Phoenix, Ariz.

4,355,032, Reexam. No. 90/000,765, Requested: Apr. 24, 1985, Cl. 424/253, 9-(1,3-DIHYDROXY-2-PROPOXYMETHYL) GUANINE AS ANTIVIRAL AGENT, Julien P. Verheyden, et al., Owner of Record: *Syntex (USA), Inc., Palo Alto, Calif.,* Attorney or Agent: Alan M. Krubiner, Ex. Gp.: 120, Requester: Howard J. Schaeffer, Raleigh, N.C.

4,385,794, Reexam. No. 90/000,767, Requested: Apr. 26, 1985, Cl. 339/36, INSULATION DISPLACEMENT TERMINAL, John E. Lucius, et al., Owner of Record: *AMP, Inc., Harrisburg, Pa.,* Attorney or Agent: Jay L. Seitchik, Ex. Gp.: 210, Requester: Molex, Inc., Lisle, Ill.

4,456,527, Reexam. No. 90/000,762, Requested: Apr. 19, 1985, Cl. 208/89, HYDROCARBON CONVERSION PROCESS, Waldeen C. Buss, et al., Owner of Record: *Chevron Research Co., San Francisco, Calif.,* Attorney or Agent: J. A. Buchanan, Jr., Ex. Gp.: 116, Requester: Exxon Chemical Co., Florham Park, N.J.

Department of the Treasury
UNITED STATES CUSTOMS SERVICE
(T.D. 85-69)
Recordation of Trade Name: "CRISSAIR INC."

Agency: U.S. Customs Service, Department of the Treasury
Action: Notice of Recordation
Summary: On Feb. 5, 1985, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "CRISSAIR INC." was published in the Federal Register (50 FR 5028). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views or arguments submitted in opposition to the recordation and received not later than Apr. 8, 1985. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "CRISSAIR

INC." is recorded as the trade name used by Crissair, Inc., a corporation organized under the laws of the State of California, located at 38905 Tenth St. E., Palmdale, Calif. 93550. The trade name is used in connection with the following merchandise manufactured in the United States: hydraulic, fuel, and pneumatic system components (such as valves and actuators) for both military and civilian aircraft and helicopters.

Date: Apr. 16, 1985

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765)

STEVEN I. PINTER,
Apr. 11, 1985 *Acting Director, Entry Procedures and Penalties Division.*

Department of the Treasury
UNITED STATES CUSTOMS SERVICE
(T.D. 85-68)
Recordation of Trade Name: "NEENAH FOUNDRY CO."

Agency: U.S. Customs Service, Department of the Treasury

Action: Notice of Recordation

Summary: On Jan. 30, 1985, a notice of application for the recordation under section 42 of the Act of July 5, 1946, as amended (15 U.S.C. 1124), of the trade name "NEENAH FOUNDRY CO." was published in the Federal Register (50 FR 4296). The notice advised that before final action was taken on the application, consideration would be given to any relevant data, views of arguments submitted in opposition to the recordation and received not later than Apr. 1, 1985. No responses were received in opposition to the notice.

Accordingly, as provided in section 133.14, Customs Regulations (19 CFR 133.14), the name "NEENAH FOUNDRY CO." is recorded as the trade name used by "Neenah, Foundry Co.," a corporation organized under the laws of the State of Wisconsin, located at 2121 Brooks Ave. (P.O. Box 729), Neenah, Wis. 54956. The trade name is used in connection with construction castings manufactured in the United States.

Date: Apr. 16, 1985.

For Further Information Contact: Harriet Lane, Entry, Licensing and Restricted Merchandise Branch, 1301 Constitution Ave., NW., Washington, D.C. 20229 (202-566-5765)

STEVEN I. PINTER,
Apr. 11, 1985 *Acting Director, Entry Procedures and Penalties Division.*

Notification of Errors in Trademark Official Gazette

In view of the establishment of in-house photocomposition of the Trademark Official Gazette, it is important that errors noted by the public be directed to a single office within the Trademark Examining Operation for verification and correction.

Written notification of errors in the publication of marks in the Trademark Official Gazette should include the correspondent's telephone number and should be addressed to the Paralegal Specialist, Office of the Deputy Assistant Commissioner for Trademarks, United States Department of Commerce, Patent and Trademark Office, Washington, D.C. 20231. Error notification may also be done by telephone to the Paralegal Specialist in the Office of the Deputy Assistant Commissioner for Trademarks, at 202-557-3268.

Applicants may use this procedure to notify the Office of errors in relation to marks published in the Official Gazette if the error is purely clerical (e.g. typographical error, drawing printed upside down, or incorrectly stated data). This procedure should not be used to dispute information that is actually of record in the application file. The Paralegal Specialist will review the notification of error and verify the existence of the clerical error, determine whether the error can be corrected without jurisdiction being restored to the Examining Attorney or republication being required, and coordinate the appropriate correction procedure.

Notification must be received by the Office within one week after the Official Gazette publication date to permit processing by the Office.

MARGARET M. LAURENCE
Apr. 11, 1985 *Assistant Commissioner for Trademarks.*

Status of PTO Services

The following is an update of the status of PTO services for April 1985:

Service Item	FY 1985 Performance Goal (Calendar Days)	Monthly Average	Comment
Filing Receipts:			
Patents	22	32	Filings have increased 9% so far this year. Staff being augmented. Goal should be met by June.
Trademarks	30	29	
Patent/Trademark Copies:			
Window Coupons	5	99% within 5 days	
Mail Coupons	29	97% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		March 20, 1985	
Current Mail Date being processed		April 17, 1985	
Certified Copies:			
Trademark Registrations	30	26	
Applications-As-Filed	20	99% within 7 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	98% within 24 hours	
Trademark Search Library:			
Filing Pending Marks	21	27	Reduced 4 days since last month.
Filing Reg. Certificates	3	8	
Assignments:			
Patents	25	18	
Trademarks	25	17	
Avg. Days from Issue Fee Payment to Issue Date	90–100	88	
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	On schedule	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	On schedule	
Patent Grants Mailed	Issue Date	On schedule	
Trademark Official Gazette:			
In Bookstore	Issue Date	Issue Date	
Mailed	Issue Date	Issue Date	
Trademark Regs. Mailed	Issue Date	Issue Date	
Patent Copies Available	Issue Date	94% within 1 day	
Trademark Copies Available	Issue Date	97% on Issue Date	

*Figures include postal processing and delivery time.

NOTICE

On June 3, 1985, the procedures of the Patent and Trademark Office will be revised to preclude removal of files or other PTO documents from the Public Search Room. The need for this action resulted from an audit conducted by the Department of Commerce Inspector General's Office which found that the practice of removing files from the premises was "contrary to Federal Law" and "not in the best interests of PTO". The audit recommended that this practice be reevaluated and discontinued.

Subsequently, the Patent and Trademark Office, pursuant to the Inspector General's recommendations, conducted an analysis of the current public stenography procedures and their effect on both the security and confidentiality required by the operations of the office.

That analysis indicates that a considerable potential for abuse exists within the current procedures and that, once the removal of files from PTO premises is accomplished, we cannot ensure the security and confidentiality of the information contained therein. The fact that PTO property was recently discovered in premises outside the scope allowed by existing procedures, indicates that the concerns upon which this revision is predicated are valid.

HELPFUL HINTS FROM THE PTO

- *Patent Applications* — We are trying to expedite and improve preliminary processing of patent applications. Please help by putting patent applications and associated papers (e.g. assignments) in separate envelopes from all other mail. Identify on the outside of the envelope "PATENT APPLICATION".
- *Application File Drawings* — Application Branch personnel are having some difficulty matching drawings with applications during pre-examination processing. It would be helpful if the applicant's name, docket number, and the title of the invention were put on the back of the drawings. This may be done by writing lightly on the drawings or by using gum labels.
- When the Office receives formal or substitute drawings, a cover letter identifying the application by serial number should accompany them. It is extemely difficult to associate the drawings with the files when this information is missing. The application serial number should be placed on the sheet of drawing in accordance with 37 CFR 1.84(l).
- *Power of Attorney* — The Office receives letters granting power to inspect patent applications. These may only be g ranted by the attorney of record or inventor. Sometimes the person signing the power is not authorized to do so, causing delay until proper authorization is received.
- *Certification Services* — Expedited service requests for certification of copies that have been made by the requester shall be limited to those files open for public inspection. If there is such a need for expedited service, the request should be made to the Manager, Examination Services Division. All other requests for copies must be made to the Certification Branch, which will fill your request within 7 days or less.
- *New Application Filing Problems* — Applications continue to be filed incorrectly under both 37 CFR 1.60 and 37 CFR 1.62. This causes problems not only for applicants but also for the Patent and Trademark Office. Filing dates are not granted to appli cations which do not comply with the rules. As a result, petitions with fees are required to be filed in such applications before a filing date will be granted.
  Most often, the problems that arise in this area can be characterized as the following:

  — Applicants continue to fail to comply with the requirements of 37 CFR 1.60 with regard to what must be submitted upon filing under the rule. This is true even after the clarifving amendments (effective Apr. 1, 1984) were made to the rule. This problem was also addressed in the Official Gazette Notice of May 8, 1984 entitled "Filing of Patent Applications Pursuant to 37 CFR 1.60."
  A true copy of the prior application must be filed including the specification (including claims), drawings, oath or declaration which must show the applicant's signature or an indication it was signed, and any amendments referred to in the oath or declaration filed to complete the prior application.
  — Applicants are using transmittal forms which request filings under one rule when, in fact, they wish to file under another rule. For example, a transmittal form requesting filing under 37 CFR 1.62 may be filed when it was really desired to file a divisional application under 37 CFR 1.60 and not to abandon the parent application.
  Applications have also been filed with a transmittal form requesting filing under 37 CFR 1.60 when it was intended to file under 37 CFR 1.62. The confusion in the record of such applications must be clarified by a decision on petition before the applications can be processed for examination.
  — Some applicants fail to realize that the parent application is abandoned by the filing of a continuing application under 37 CFR 1.62. Paragraph (g) of 37 CFR 1.62 states:

  > "The filing of a request for a continuing application under this section will be considered to be a request to expressly abandon the prior application as of the filing date granted the continuing application."

  Correction after such a mistaken filing under 37 CFR 1.62 usually requires a revival of the parent application under 37 CFR 1.137 (a) or (b) which expends resources of both the applicant and the PTO.
  — Some applicants are attempting to file continuing applications under 37 CFR 1.62 after payment of the issue fee in the parent application. Such applications are improper and are not entitled to a filing date. Additionally, such filings will not affect the prior application, i.e., the parent application may issue as a patent. Paragraph (a) of 37 CFR 1.62 specifies that continuing applications may be filed under 37 CFR 1.62 "before the payment of the issue fee, abando nment of, or termination of proceedings on the prior application".
  — Some applicants are attempting to file continuation-in-part applications under 37 CFR 1.62 with a new specification rather than with the changes made by amendment to the prior application. As stated in 37 CFR 1.62(a) filings under 37 CFR 1.62 use the specification of the prior application.
  Paragraph (c) of 37 CFR 1.62 also states:

  > "In the case of a continuation-in-part application which *adds and claims additional disclosure by amendment,* an oath or declaration as required by §1.63 must also be filed. . . ." (emphasis added)

May 3, 1985.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of May 28, 1985

Re. 31,590	4,461,905	4,481,504	4,491,503
Re . 31,753	4,462,049	4,483,745	4,491,585
4,065,529	4,462,535	4,484,103	4,491,757
4,218,543	4,462,866	4,484,252	4,491,825
4,345,148	4,464,281	4,484,395	4,492,277
4,356,673	4,464,492	4,484,408	4,492,656
4,364,803	4,466,680	4,484,797	4,492,800
4,370,567	4,467,586	4,485,003	4,493,163
4,385,513	4,467,703	4,485,191	4,493,237
4,399,132	4,468,117	4,485,301	4,493,500
4,404,008	4,468,593	4,485,338	4,493,655
4,407,366	4,468,919	4,486,040	4,493,843
4,410,458	4,469,806	4,486,200	4,493,886
4,415,580	4,470,052	4,486,201	4,493,924
4,416,802	4,470,485	4,486,582	4,493,976
4,422,148	4,470,568	4,486,618	4,493,981
4,430,324	4,472,780	4,486,644	4,494,092
4,434,103	4,473,337	4,486,704	4,494,172
4,440,287	4,473,602	4,486,783	4,494,424
4,442,279	4,474,321	4,486,921	4,494,693
4,442,317	4,474,891	4,487,020	4,494,706
4,443,658	4,475,395	4,487,262	4,494,888
4,44 .,157	4,475,705	4,487,477	4,495,226
4,444,571	4,475,925	4,487,583	4,495,353
4,444,603	4,476,584	4,488,232	4,495,932
4,444,829	4,477,302	4,488,624	4,496,418
4,449,509	4,477,854	4,488,740	4,496,590
4,451,449	4,478,623	4,489,163	4,497,023
4,454,343	4,479,068	4,489,248	4,497,499
4,455,975	4,479,632	4,489,300	4,497,544
4,457,325	4,479,936	4,490,136	4,497,751
4,458,099	4,480,019	4,490,192	4,497,934
4,458,261	4,480,043	4,490,297	4,498,236
4,458,490	4,480,113	4,490,424	4,498,296
4,458,503	4,480,121	4,490,522	4,498,741
4,459,591	4,480,145	4,490,974	4,500,584
4,459,770	4,480,413	4,491,313	4,510,066
4,461,820	4,481,427	4,491,326	

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

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	Miami–Dade Public Library	(305) 579-5001
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Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4243
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	Dallas Public Library	(214) 749-4176
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*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 27, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	3-28-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	12-12-83
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	5-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	11-05-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	1-04-83
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	5-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-22-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	10-1-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	9-28-82
DESIGN, GROUP 290—K. L. CAGE, Director	1-03-83
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-28-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	5-26-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	3-08-83
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	1-31-83
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	4-11-83

Expiration of patents: The patents within the range of numbers indicated below expire during April 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,375,529 to 3,381,302, inclusive

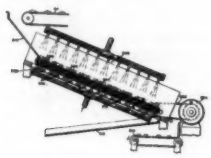
Plant Patents . . . . . Numbers 2,802 to 2,810 inclusive

REEXAMINATIONS

MAY 28, 1985

Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 3,665,554 (351st)
METHOD OF EVISCERATING SHELLFISH
Richard T. Wenstrom, Hampton, Va., and Thomas S. Gorton, Jr., Cambridge, Mass., assignors to Slade Gorton & Co., Inc., Boston, Mass.
Reexamination Request No. 90/000,400, Jun. 16, 1983.
Reexamination Certificate for Patent No. 3,665,554, issued May 30, 1972, Ser. No. 71,118, Sep. 10, 1970.
Division of Ser. No. 659,274, Jul. 17, 1967, Pat. No. 3,528,124.
Int. Cl.[3] **A22C** *29/00*
U.S. Cl. 17—45



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **1–5** is confirmed.

New claims **6** and **7** are added and determined to be patentable.

2. The method of removing the viscera from scallops which comprises the steps of feeding a plurality of scallops over a series of pairs of reversely rotating rollers arranged in an inclined flight in a direction substantially perpendicular to the axis of the rollers, successively rotating the scallops with all or less than all of the viscera attached thereto in one direction about their axes while progressively pinching and successively removing portions of the viscera and then rotating the rollers in another direction about their axes for moving the scallops over the flight of rollers to clean the viscera therefrom.

B1 3,903,127 (352nd)
PROCESS FOR THE PRODUCTION OF POLYISOCYANATES WITH A BIURET STRUCTURE
Kuno Wagner; Johannes Eimer; Joachim Zirner, all of Leverkusen; Rainer Raab, Odenthal, and Dietrich Liebsch, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Reexamination Request No. 90/000,333, Mar. 1, 1983.
Reexamination Certificate for Patent No. 3,903,127, issued Sep. 2, 1975, Ser. No. 441,778, Feb. 12, 1974.
Claims priority, application Fed. Rep. of Germany, Feb. 17, 1973, 2308015
Int. Cl.[3] **C07C** *118/00, 119/42*
U.S. Cl. 260—453 AB

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claim **3** is cancelled.

Claims **1**, **2**, **4**, and **5** are determined to be patentable as amended.

1. A process for producing a polyisocyanate with a biuret structure, said polyisocyanate having a maximum viscosity of 50,000 cP at 20° C., said process comprising

A. reacting (1) excess quantities of [an organic] *hexamethylene* diisocyanate [having aliphatically bound isocyanate groups] with (2) a biuretizing agent selected from the group consisting of water and organic compounds which convert organic isocyanates into the corresponding biurets at elevated temperatures, the substituents of said organic compounds being inert in the biuretization process and not forming a constituent of the biuret, at a temperature of from 60° C. to 250° C., and

B. removing excess unreacted *hexamethylene* diisocyanate, said process characterized in that the [organic] *hexamethylene* diisocyanate and biuretizing agent are used in proportions corresponding to a molar ratio of diisocyanate to monofunctional biuretizing agent of at least 11:1.

B1 4,168,315 (353rd)
***NOVEL* DIANISYL THIAZOLE COMPOUND, COMPOSITIONS AND METHOD OF ANTITHROMBOTIC TREATMENT**
Ronald H. Rynbrandt, Portage, and Edward E. Nishizawa, Schoolcraft Township, Kalamazoo County, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Reexamination Request No. 90/000,466, Nov. 7, 1983.
Reexamination Certificate for Patent No. 4,168,315, issued Sep. 18, 1979, Ser. No. 837,083, Sep. 28, 1977.
Int. Cl.[3] **C07D** *277/20;* **A61K** *31/425*
U.S. Cl. 424—270

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claims **2** and **3** is confirmed.

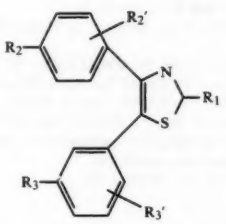
Claims **5**, **7** and **18** are cancelled.

Claims **1**, **8**, **9**, **12** and **16** are determined to be patentable as amended.

Claims **4**, **6**, **10**, **11**, **13–15** and **17**, dependent on an amended claim, are determined to be patentable.

1. A compound of the formula

Formula I

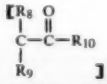


wherein R_2 and R_3 are the same or different, and are selected from the group consisting of hydrogen, fluorine, chlorine, bromine, trifluoromethyl, alkoxy of from one to four carbon atoms, inclusive, thioalkyl of from one to four carbon atoms, inclusive, and alkyl of from one to four carbon atoms, inclusive; R_2' and R_3' are the same or different and are chosen from

the group consisting of hydrogen and alkoxy *of* from one to four carbon atoms, inclusive, with the proviso that when R_2' is alkoxy, then $R_2=R_2'$ and when R_3' is alkoxy then $R_3=R_3'$; R_1 is selected from the group consisting of [hydrogen;] trifluoromethyl[;] *and*

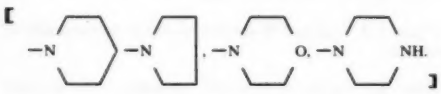
wherein R_4 is hydrogen, alkyl of one to four carbon atoms, inclusive, or

wherein R_5 is alkyl of one to six carbon atoms, inclusive, R_6 and R_7 are the same or different and are chosen from the group consisting of hydrogen and alkyl of one to three carbon atoms[.]



[where R_8 and R_9 are the same or different and are chosen from the group consisting of alkyl of from one to three carbon atoms, inclusive, R_{10} is alkoxy of from one to three carbon atoms, inclusive]

[wherein R_{11} and R_{12} are the same or different and are chosen from the group consisting of hydrogen, alkyl of from one to six carbon atoms, inclusive, cycloalkyl of from five to seven carbon atoms, inclusive, or taken together with the nitrogen atom to which they are attached,]



B1 4,291,597 (354th)

CORK EXTRACTOR

Herbert Allen, Houston, Tex., assignor to Hallen Company, Houston, Tex.

Reexamination Request No. 90/000,217, Jun. 10, 1982.
Reexamination Certificate for Patent No. 4,291,597, issued Sep. 29, 1981, Ser. No. 17,598, Mar. 5, 1979.
Continuation-in-part of Ser. No. 925,365, Jul. 17, 1978.
The portion of the term of this patent subsequent to Jul. 7, 1998, has been disclaimed.
Int. Cl.³ B67B *7/00*
U.S. Cl. 81—3.48

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **7** is confirmed.

Claims **1** and **6** are determined to be patentable as amended.

Claims **2–5**, dependent on an amended claim, are determined to be patentable.

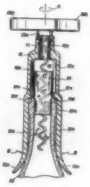
New claim **8** is added and determined to be patentable.

1. Cork extracting apparatus including;

a helical corkscrew comprising a central body and an outer layer of friction reducing polymeric material on at least a portion of the downwardly facing surfaces of said central body;

guide means receiving said corkscrew and permitting longitudinal and rotative movement of said corkscrew;

bottle-engaging means connected to said guide means for positioning said guide means and said corkscrew in generally coaxial alignment with the neck of a bottle, said bottle-engaging means including stop means for limiting downward movement of said guide means with respect to said bottle;



spacer means interconnecting said guide means and said bottle-engaging means and spacing said guide means upwardly from said bottle-engaging means, said spacer means defining an opening for receipt of said cork as it emerges from said bottle;

and abutment means carried by said corkscrew for limiting downward movement of said corkscrew with respect to said guide means;

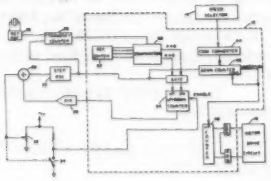
said corkscrew being of a length such that, when said abutment means are engaged to so limit downward movement of said corkscrew, said corkscrew extends into said cork-receiving opening whereby said cork may move threadedly upwardly on said corkscrew as said corkscrew is rotated to withdraw said cork from said bottle.

B1 4,294,086 (355th)

LATCH NEEDLE FOR KNITTING MACHINES

Harald Mayer, and Hardo Berentzen, both of Albstadt, Fed. Rep. of Germany, assignors to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft, Albstadt, Fed. Rep. of Germany

Reexamination Request No. 90/000,556, May 18, 1984.
Reexamination Certificate for Patent No. 4,294,086, issued Oct. 13, 1981, Ser. No. 887,587, Mar. 17, 1978.
Claims priority, application Fed. Rep. of Germany, Apr. 1, 1977, 2714607
Int. Cl.³ D04B *35/04*
U.S. Cl. 66—121



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

The patentability of claim **1** is confirmed.

1. A latch needle for knitting or like machines comprising:

an elongated needle shank having an upper edge and a lower edge, and a hook at at least one end thereof and a longitudinally-extending slot formed therein flanked by a pair of opposed faces, and a latch pivotably mounted in said slot and having a spine with a widened wedge-like, rounded portion, said needle shank having a supporting portion for the widened, rounded portion of the spine of the latch at the faces of said shank flanking said longitudinal slot and said supporting portion being recessed relative to the upper edge of said needle shank, said longitudinal slot having a short recessed portion defined by a curved base wall containing an aperture leading to the lower edge of said needle shank and a further portion adjacent to said short portion which defines a channel characterized by an initial substantially rectilinear base wall and a further curved base wall which merges with said upper edge of the needle shank, said supporting portion of said needle shank for said widened, rounded portion of the spine of the latch being located over the substantially rectilinear base wall region of said further portion and said channel of said further portion being deeper than half the height of said needle shank in said substantially rectilinear base wall region and projecting in length beyond the end of said latch when in its rearward open position displaced away from its associated hook.

B1 4,377,847 (356th)

MICROPROCESSOR CONTROLLED MICRO-STEPPING CHART DRIVE

Richard A. Daniel, Lakewood, and Ronald J. Geil, Vermilion, both of Ohio, assignors to Gould Inc., Rolling Meadows, Ill.

Reexamination Request No. 90/000,554, May 14, 1984.
Reexamination Certificate for Patent No. 4,377,847, issued Mar. 22, 1983, Ser. No. 234,975, Feb. 17, 1981.
Int. Cl.[3] **G06F** *15/46;* **G05B** *19/40*
U.S. Cl. 364—400

AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

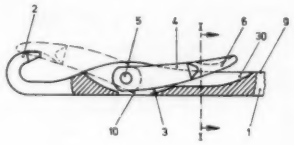
Claims **1–4** are cancelled.

[1. A micro-stepping control circuit for a stepper motor of the type used to drive the chart within an oscillographic recorder, said micro-stepping control circuit comprising:

a speed selector means for selecting the speed at which said stepper motor will drive said chart;

a step oscillator means for providing a step frequency pulse signal;

a controller means, said controller means being operatively connected to said speed selector means and said step oscillator means, said controller internally generating a numerical constant whose value is determined by the speed selector means, said numerical constant being either decremented or incremented by at least one pulse from



said step oscillator means, said controller means determining if said numerical constant has reached to some predetermined value and then generating a signal indicative thereof; and

drive means operatively connected to said controller means and said stepper motor for driving said stepper motor with a full wave rectified sine and cosine signal broken into staircase increments, said drive means being updated whenever said controller means determines that said numerical constant reaches said predetermined value wherein update for said drive means provides a incremental part of a full step of said stepper motor,

whereby said chart speed is determined by said numerical constant and the time it takes to reach said predetermined value.**]**

REISSUES

MAY 28, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

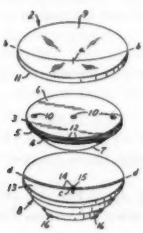
Re. 31,897
METHOD FOR THE ALTERATION OF A LENS

Dee Lynn Johnson, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,962,833, dated Jun. 15, 1976, Ser. No. 563,389, Mar. 31, 1975. Application for reissue May 17, 1978, Ser. No. 906,745

Int. Cl.³ B24B *1/00, 13/00*

U.S. Cl. 51—284 R **19 Claims**



27. The method of altering a lens comprising the steps of:

a. adhesively attaching and conforming a conformable lens adhesive blocking pad to one face of a lens, wherein said blocking pad comprises a conformable substrate having a pressure sensitive adhesive applied to the planar surfaces thereof and alignment means therein, and wherein the optical center of said lens is visible through said alignment means;

b. visually aligning the optical center of said lens with the center point of a rigid lens block through said alignment means;

c. adhesively attaching said lens to said block in the aligned condition by means of said pad; and

d. altering said lens.

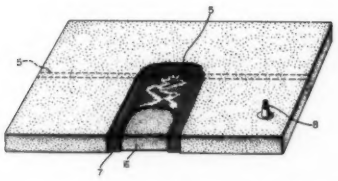
Re. 31,898
INFLATABLE-DEFLATABLE FLEXIBLE STRUCTURAL COMPONENT

Charles A. Suter, Stow, Ohio, assignor to Goodyear Aerospace Corporation, Akron, Ohio

Original No. 3,675,377, dated Jul. 11, 1972, Ser. No. 69,076, Sep. 2, 1970. Application for reissue May 17, 1984, Ser. No. 611,460

Int. Cl.³ E04B *1/343;* **E04G** *9/08;* **B32B** *3/08*

U.S. Cl. 52—2 **3 Claims**



1. An inflatable-deflatable flexible structural component comprising a flexible open celled foam core portion having a fabric covering adhered to and enclosing said foam and having a valve means in communication therewith, the fabric being sealed against loss of air by a flexible elastomeric coating.

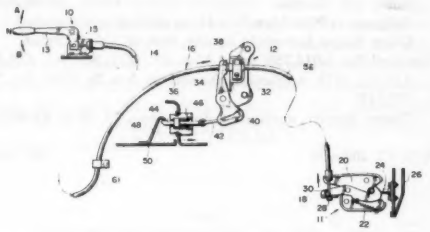
Re. 31,899
REMOTE CONTROL ARRANGEMENT

Haruo Mochida, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Original No. 4,374,597, dated Feb. 22, 1983, Ser. No. 222,454, Jan. 5, 1981. Application for reissue Sep. 8, 1983, Ser. No. 530,257

Int. Cl.³ E05C *9/00*

U.S. Cl. 292—8 **14 Claims**



5. A remote control arrangement comprising:

a first mechanism;

a second mechanism;

a wire operatively connected at one end to said first mechanism and which is slidably disposed through said second mechanism;

an actuating mechanism having a stationary member and a lever operatively connected to the other end of said wire for selectively moving said wire in first and second axial directions, said first mechanism being operated when said wire is moved in said first axial direction;

a first flexible housing disposed about said wire between said actuating mechanism and said second mechanism, said first flexible housing being operatively connected to said second mechanism;

a second flexible housing disposed about said wire between said second mechanism and said first mechanism, and

a stopper fixed on said wire and adapted to abut a stationary member of said second mechanism when said wire is moved in said second axial direction, said second mechanism being operated when said wire is moved in said second axial direction.

Re. 31,900
PROCESS FOR THE FLOCCULATION OF SUSPENDED SOLIDS

Frederick Halverson, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Original No. 4,342,653, dated Aug. 3, 1982, Ser. No. 216,891, Dec. 16, 1980. Continuation-in-part of Ser. No. 156,145, Jun. 3, 1980, abandoned, which is a continuation-in-part of Ser. No. 012,274, Feb. 15, 1979, abandoned. Application for reissue Mar. 16, 1983, Ser. No. 475,963

Int. Cl.³ C02F *1/56*

U.S. Cl. 210—734 **5 Claims**

7. A process for flocculating suspending phosphate slime solids from an aqueous suspension thereof which comprises:

(a) Adding to said suspension an effective amount of a polymeric anionic flocculant comprising:

i. about 40 to about 99 mole percent of repeating units derived from acrylamide;

ii. about 10 to about 20 mole percent of repeating units derived from 2-acrylamido-2-methylpropanesulfonic acid; and

iii. 0 to about 25 mole percent of repeating units derived from acrylic acid;

and wherein said polymeric anionic flocculant has a Brookfield viscosity of about 2.0 centipoises;

(b) Flocculating said solids causing them to settle; and

(c) Compacting the settled floc to produce an underflow of flocculated material with a solids content greater than that of the suspended solids; where the polymeric anionic flocculant has a Brookfield viscosity of at least about 2.0 centipoises.

Re. 31,901

CONTINUOUS ELECTROLYTICAL TREATMENT OF ALUMINUM OR ITS ALLOYS

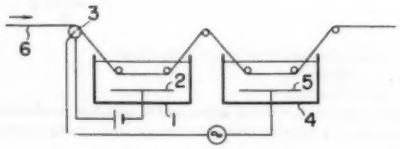
Satoshi Kawai; Yoichi Yamagiwa, both of Chigasaki; Masashi Mizusawa, Fugisawa; Hiroshi Watanabe, Hiratsuka; Yoshio Ando, and Masaaki Takahashi, both of Tokyo, all of Japan, assignors to Pilot Man-Nen-Hitsu Kabushiki Kaisha and Toyo Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Original No. 4,014,758, dated Mar. 29, 1977, Ser. No. 570,376, Apr. 22, 1975. Application for reissue Jun. 24, 1981, Ser. No. 277,613

Claims priority, application Japan, Apr. 23, 1974, 49-46209

Int. Cl.³ C25D *7/06*

U.S. Cl. 204—28 **10 Claims**



10. A process for electrolytically treating aluminum or its alloy in the form of a strip, wire or foil material in a continuous manner which comprises continuously passing the material first through a negatively charging cell, then through an anodic oxidation treatment cell and finally through an electrolytic coloring cell, each cell containing therein an electrolytic solution and comprising an electrode immersed in the electrolytic solution; wherein a circuit is formed by commonly connecting to the electrode in the negatively charging cell a power source for anodizing and a power source for electrolytically coloring, said power source for anodizing being further connected to the electrode in the anodic oxidation treatment cell and said power source for electrolytically coloring being further connected to the electrode of the electrolytic coloring cell, said power source for anodizing being DC and the power source for electrolytically coloring being AC, or the power source for both of them being a single AC-superimposed DC, whereby a current having an alternative wave form rich in positive component is supplied to the electrode of the electrolytic coloring cell, and the aluminum material is negatively charged through the electrolytic solution in the negatively charging cell, anodized in the anodic oxidation treatment cell and colored in the electrolytic coloring cell.

Re. 31,902

DISPERSION STRENGTHENED METALS

Anil V. Nadkarni, Mentor, Ohio, assignor to SCM Corporation, New York, N.Y.

Original No. 4,315,770, dated Feb. 16, 1982, Ser. No. 146,140, May 2, 1980. Application for reissue Dec. 27, 1983, Ser. No. 565,342

Int. Cl.³ B22F *9/00*

U.S. Cl. 75—0.5 BC **10 Claims**

1. In a process for dispersion-strengthening atomized alloy particles having an average particle size less than about 300 microns by internally oxidizing said alloy particles, the improvement comprising:

providing atomized *copper/aluminum* alloy particles being substantially free of oxide surface film whereby said alloy is internally oxidized without obstruction of the oxide surface film.

PLANT PATENTS

GRANTED MAY 28, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,476
CARNATION NAMED LONBALMA

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jun. 25, 1983, Ser. No. 517,232
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinctive carnation cultivar, substantially as herein shown and described, characterized by the generally violet colored striation on the lightly pinkish background of the many petals of its medium sized blooms.

5,477
CHRYSANTHEMUM

Johannes W. Hubertus van Veen, Ter Aar, Netherlands, assignor to Chrysanthemum Breeders Assoc. N.V., Curacao, Netherlands Antilles

Filed Jul. 25, 1983, Ser. No. 517,219
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—74 **1 Claim**

1. A new and distinct cultivar of chrysanthemum, substantially as described and pictured herein, characterized by its pure white blooms, vigorous growth, eight and one-half week response and permanence.

5,478
CHERRY TREE (KING-44-P-477)

Fred W. Anderson, deceased, late of Merced, Calif., and by Wendel J. Olson, heir, 6015 N. Country Club Pl., Merced, Calif. 95340

Filed Sep. 2, 1983, Ser. No. 528,900
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—37 **1 Claim**

1. A new and distinct variety of cherry tree, substantially as illustrated and described, characterized, in particular, by blooming approximately four days before the Bing, and by the regular and very productive bearing of tough-skinned, firm, sweet, excellent quality, semi-freestone fruit which ripens approximately one week before the Bing; the stem of the fruit being easily detached from the fruiting spurs yet firmly attached to the fruit, and there being resistance to occurrence of spurs and doubling in the fruit in very hot climatic conditions.

5,479
POINSETTIA PLANT NAMED RED CHAMPION

Jack S. Sweet, St. Petersburg, Fla., assignor to Earl J. Small Growers, Inc., Pinellas Park, Fla.

Filed Jul. 19, 1983, Ser. No. 515,155
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct cultivar of poinsettia plant named Red Champion, substantially as illustrated and described, and particularly characterized by its large and deeper than normal red bracts and darker than normal green foliage, very vigorous and strong stems, long lasting characteristics for both foliage and bracts, excellent breaking when pinched, and its ease of propagation from cuttings.

5,480
NECTARINE TREE—N15500

Glenn T. Nakagawa, 15500 S. Chestnut Ave., Fresno, Calif. 93725, assignor to Glenn T. Nakagawa, Fresno and Allan T. Nakagawa, Selma, both of, Calif.

Filed Sep. 26, 1983, Ser. No. 535,734
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, particularly characterized, in comparison with the Flamekist, by late-ripening, clingstone fruit which, at commercial maturity, has more red blush and more skin wax, whereby the fruit has a brighter, glossier overall external finish and appearance.

5,481
ROSE PLANT

O. L. Weeks, 926 W. Philadelphia, Ontario, Calif. 91761

Filed Oct. 11, 1983, Ser. No. 540,413
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by large, well petaled cardinal red flowers borne one to a stem on a vigorous plant.

PATENTS

GRANTED MAY 28, 1985

ERRATA

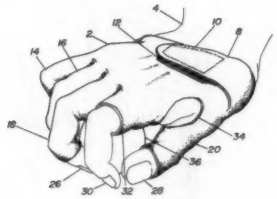
For CLASS	See PATENT NO.
105–218	4,519,329
227–152	4,519,616
111–065	4,519,735
415–092	4,519,744
209–040	4,519,896
427–083	4,520,010
514–012	4,520,016
514–054	4,520,017
514–469	4,520,018
514–212	4,520,021
514–200	4,520,022
514–241	4,520,023
514–255	4,520,024
514–275	4,520,025
514–299	4,520,026
514–354	4,520,027
514–447	4,520,028
514–479	4,520,029
514–629	4,520,030
514–632	4,520,031
514–156	4,520,131
514–560	4,520,132
514–568	4,520,133
514–625	4,520,134
514–598	4,520,176
514–085	4,520,226

PATENTS

GRANTED MAY 28, 1985

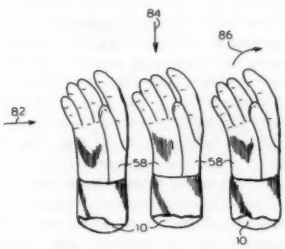
GENERAL AND MECHANICAL

4,519,097
VIDEO GAME PROTECTIVE GLOVE
Johnny L. Chappell, Jr., 5433 Colfax Ave. South, Minneapolis, Minn. 55419, and Charles Johnson, 30 W. 93rd St., No. 204A, Bloomington, Minn. 55420
Filed Apr. 7, 1983, Ser. No. 482,866
Int. Cl.[3] A41D *13/10*
U.S. Cl. 2—16 **2 Claims**



1. A protective glove comprising: a glove body, an adjustable means for securing the glove on a user's hand, while adapting the glove for various hand sizes, said adjustable means adapted to leave the user's wrist unfettered and said adjustable means comprising VELCRO hook and loop fasteners; protective fingers at the little finger, ring finger and thumb positions comprising an open-ended tube from the glove body to cover the distal knuckle on these fingers while leaving the fingertips of the user's hand uncovered for better sensitivity of touch; a shorter protective finger at the forefinger position extending from the glove body to approximately one-half the distance of the proximal phalanx of the forefinger to allow greater sensitivity and freedom for the forefinger of the user's hand; and, ventilation means comprising a relatively large opening between the thumb and forefinger covers on said glove and adapted to prevent the user's hand from perspiring while providing the hand with sensitive feel of a video game control.

4,519,098
WEARING APPAREL AND METHODS FOR MANUFACTURING OF WEARING APPAREL
Robert W. Dunmire, Coshocton; Drew J. Miller, Canton, and Michael D. Johnson, Coshocton, all of Ohio, assignors to Becton, Dickinson and Company, Paramus, N.J.
Filed Jun. 8, 1983, Ser. No. 502,396
Int. Cl.[3] B29D *27/04*; A41D *19/00*; B29C *13/04*; B29H *3/044*
U.S. Cl. 2—161 R **30 Claims**



1. A work glove, said glove formed in place on a mold passing through a production line; said glove formed by the steps of

(a) dipping in a second dipping step said plurality of liners formed on said molds in an adhesive dip;

(b) indexing said plurality of molds from said second dipping step upwardly;

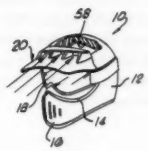
(c) applying a third applying step by blowing a quantity of said fibers from said first selecting step onto the surfaces of said formed liners on said plurality of molds;

(d) blowing off excess fibers from said molds from said third applying step;

(e) applying elevated temperatures to said plurality of molds from said third applying step for a period of time sufficient to dry said plurality of partially formed gloves thereon; and

(f) applying higher elevated temperatures to said plurality of molds from said drying step for a time sufficient to process to final form the said plurality of partially formed gloves on said plurality of molds.

4,519,099
HELMET
Tadashi Kamiya; Kazuhiro Kawasaki, and Akio Muranaka, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 31, 1983, Ser. No. 527,983
Claims priority, application Japan, Sep. 3, 1982, 57-133885[U]
Int. Cl.[3] A42B *1/08*
U.S. Cl. 2—424 **14 Claims**



1. A helmet having a face opening comprising, a detachable visor assembly including a visor plate extending outwardly from the front of the helmet above the face opening, inlet air guide means adjacent said visor plate forming a plurality of frontal air pressure cavities with said visor plate, and the helmet having a plurality of interior venting channels connecting to inlet air at said frontal air pressure cavities and exiting air at the rear of said helmet.

4,519,100
DISTAL LOCKING INTRAMEDULLARY NAIL
Robert P. Wills, and Andrew F. Brooker, both of Baltimore, Md., assignors to Orthopedic Equipment Co. Inc., Bourbon, Ind.
Filed Sep. 30, 1982, Ser. No. 430,411
Int. Cl.[3] A61F *1/00*
U.S. Cl. 3—1.9 **15 Claims**

1. A dynamic compression nail of intermedullary compression nailing, said nail comprising:

an elongated sheath having a front end and longitudinal slots proximate to said front end and at least partially circumferentially spaced therearound,

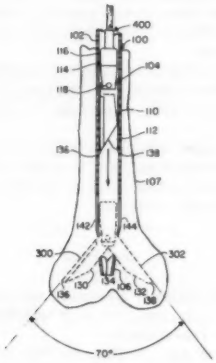
means for fixedly attaching said sheath to the proximal end of the fractured bone,

a conector member dimensioned to freely slide longitudinally within said sheath without rotation relative to said sheath,

a plurality of blades pivotally coupled to said connector member,

means for pivoting each blade outwarly to project through a respective one of said slots and to engage bone tissue at the

distal end of the bone, wherein each slot has a greater longitudinal dimension than the width of the outwardly projecting blades thereby enabling said blades to translate longitudinally within said slot, and said blades are free to move axially with respect to said sheath within the length of said slots, and



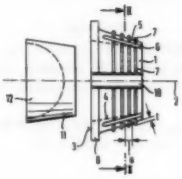
wherein said connector member and said pivoting means are arranged such that when said sheath is fixedly secured to said bone and said connector member is translated longitudinally towards said front end to engage said pivoting means, pivoting said blades outwardly through said slots and into said intermedullary bony tissue secures said nail across the fracture site and permits axial bone movement across the fracture site.

4,519,101

JOINT SOCKET

Adam Schreiber, Kusnacht, and Jacob Hilaire, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 3, 1983, Ser. No. 454,987
Claims priority, application Switzerland, Jan. 8, 1982, 91/82
Int. Cl.³ A61F *1/04*
U.S. Cl. 3—1.912 **10 Claims**



1. A joint socket for anchoring in a bone in cement-free manner; said joint socket comprising

a longitudinally split sleeve of truncated conical shape open at opposite ends to permit radial expansion, said sleeve having a plurality of circumferential depressions defining a plurality of circuumferentially projecting ribs on an outer surface, a plurality of longitudinally disposed grooves in said outer surface and an internal cavity of conical shape; and

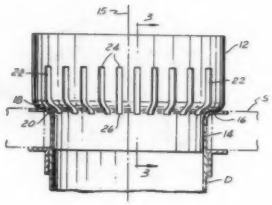
a conical insert sized to fit into said cavity of said sleeve in wedging relation and having an internal socket for receiving a joint head.

4,519,102

GARBAGE DISPOSAL GUARD

Ernest Efstratis, 6775 Wing Lake Rd., Birmingham, Mich. 48010

Continuation-in-part of Ser. No. 294,722, Aug. 20, 1981, abandoned. This application Dec. 7, 1983, Ser. No. 559,621
Int. Cl.³ E03C *1/26*
U.S. Cl. 4—292 **1 Claim**

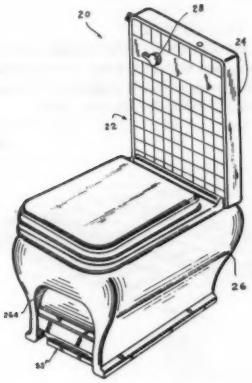


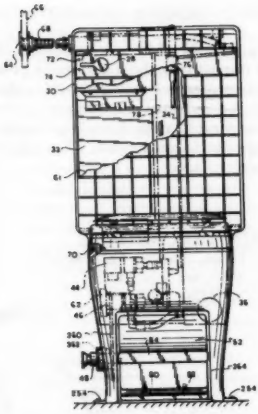
1. A garbage disposal guard comprising a sleeve of flexible, resilient plastic material having an upper substantially cylindrical wall portion of relatively large diameter which is open at the top and a lower substantially cylindrical base portion of smaller diameter than and concentric withsaid wall portion and which is open at the bottom, said wall and base portions being integrally joined by a substantially annular shoulder portion which is disposed substantially perpendicular to said wall and base portions, said shoulder portion merges into said wall and base portions via arcuate portions, said sleeve being adapted to be installed in the drain of a sink equipped with a garbage grinder with its shoulder portion seated upon a portion of the sink surrounding the drain, its base portion extending down into the drain and its wall portion projecting up above the drain, and passage means in said sleeve permitting the flow of liquid from said sink into said drain when said sleeve is installed as aforesaid, said passage means comprising a multiplicity of equally laterally spaced, elongated parallel slots extending through the wall, arcuate portions shoulder and base portions of said sleeve and each disposed in a plane which contains the longitudinal center line of said sleeve, the upper end of each slot being disposed near the mid point of said wall portion in spaced relation above said shoulder portion, each slot extending from its upper end downwardly through the lower part of said wall portion, through said shoulder portion and arcuate portions to its lower end above the bottom edge of said base portion, said slots being relatively narrow but sufficient in number to allow a large enough volume of water flow for the efficient operation of the garbage grinder yet each being sufficiently narrow to prevent flatware and the like from passing through and falling down the drain into the grinder, said sleeve being of one-piece construction and of uniform thickness throughout its full extent, the interior of said sleeve being open and unobstructed from top to bottom so that garbage may be introduced into the relatively large diameter wall portion and passed through the guard and into the grinder while the guard is installed as aforesaid in the drain of the sink, said sleeve being longitudinally split from the upper edge of said wall portion continuously down through the lower edge of said base portion to permit said sleeve to be circumferentially compressed to a smaller diameter in order to fit into drains of different diameters.

4,519,103
SELF-CONTAINED SEWAGE WASTE DISPOSAL SYSTEM

Kenneth J. De Graw, Montvale; William R. Bocchini, Wyckoff; Brian Wilcockson, Wayne; Armen Bogossian, Teaneck; Robert J. Ulh, Wayne; Earl E. Nause, Bellville, and Ernest R. Ramirez, Far Hills, all of N.J., assignors to American Standard Inc., New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,654
Int. Cl.[3] E03D *5/019, 5/016*
U.S. Cl. 4—317 18 Claims



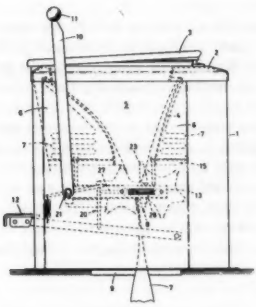


1. A self-contained sewage waste disposal system comprising; a housing structure, a tiolet bowl adapted to receive human waste and fluid for diluting the waste, transporting the waste and rinsing the bowl, a removable filter cassette in the housing in communication with the tiolet bowl, means for flushing the bowl and dumping the contents into the filter cassette and for subsequent refilling of the bowl, filter means in the cassette for separating the coarse and fine particles of solid material from the fluid received from the bowl, storage means in the cassette to store the solid material in a compact manner for subsequent disposal upon removal of the cassette, a reservoir for storage of fluid after removal of solid material therefrom in the cassette, said reservoir being located exteriorly of the cassette, pump means including interconected conduits in the housing to transport fluid from the interior of the system to fill the bowl after a flush and to transport filtered fluid from the filter cassette to a position for recirculation and to the reservoir, means for immediately removing the filtered fluid from the cassette and transferring it to the reservoir after separation from the solid materials, and control means to pass the fluid through the system to facilitate the collection and disposal of sewage waste within the system in a predetermined sequence and to facilitate immediate removal of filtered fluid from the cassette to the reservoir for storage until the next operational sequence without danger of contacting the stored solid material in the cassette.

4,519,104
DEVICE FOR COLLECTING SOLID OR FLUID WASTE

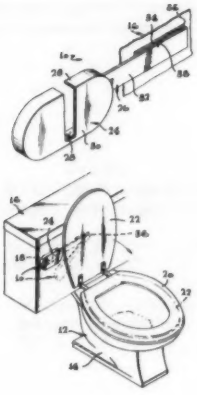
Karl I. Nilsson, Linköping, Sweden, assignor to Klintland, Sweden

PCT No. PCT/SE82/00225, § 371 Date Feb. 18, 1983, § 102(e) Date Feb. 18, 1983, PCT Pub. No. WO83/00082, PCT Pub. Date Jan. 20, 1983
PCT Filed Jul. 3, 1982, Ser. No. 474,572
Claims priority, application Sweden, Jul. 3, 1981, 8104145
Int. Cl.[3] A47K *11/00*
U.S. Cl. 4—484 1 Claim



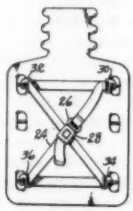
1. In a device for collecting solid or fluid waste in a tube formed of thin flexible impermeable material of considerable length, the tube being stored in a folded or pleated accordian-like fashion and kept outside of a funnel shaped body, the tube being arranged to be advanced over the upper edge of the funnel-shaped body and through a duct exiting from the bottom of the funnel shaped body, a waste receiving chamber positioned below the duct into which the flexible tube is advanced through the duct by means of a feed mechanism, said feed mechanism being arranged to feed a predetermined length of tube and its contents into the waste-receiving chamber, and said feeding mechanism comprises two oppositely mounted rollers which are positioned transverse to the feeding direction of the tube, said rollers serving to advance the tube when the rollers are rotated at essentially equal speed in opposite direction, said rollers being equipped with radially protruding flanges which extend along the full length of the rollers, the improvement wherein the rollers are provided at each end with tilted sliding surfaces against which the outer radial ends of the radial flanges of the other roller are arranged to slide as the rollers rotate, said sliding surfaces being arranged at an angle to the radial direction of each associated flange so as to provide a space for collected waste between the radial flanges as the rollers rotate, each flange being provided with a sealing tip extending axially between the sliding surfaces for engaging the tube extending over the surface of the adjacent roller to provide for sealing of the tube.

4,519,105
APPARATUS FOR CLOSING TOILET SEAT COVER
James R. Blanck, 8401 Remmet St., Canoga Park, Calif. 91304
Filed Apr. 16, 1984, Ser. No. 601,016
Int. Cl.³ A47K *17/00*
U.S. Cl. 4—661 **18 Claims**



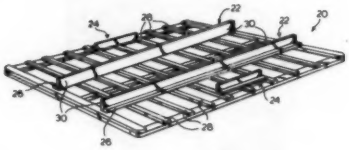
1. An apparatus for closing a toilet seat cover comprising:
a handle guard configured to interact with a toilet flush handle on a toilet tank when said handle guard is in a first position to inhibit access to the flush handle; and
attachment means for movably attaching said handle guard to a toilet tank so that when the toilet seat cover is in a raised position, said handle guard is in said first position wherein said handle guard inhibits access to the flush handle and said attachment means also being for moving the toilet seat cover toward the closed position upon movement of said handle guard away from its first position to achieve access to the toilet flush handle.

4,519,106
SPINE BOARD
Ralph Sandquist, R.D. #3, Jamestown, N.Y. 14701
Filed Aug. 19, 1981, Ser. No. 255,269
Int. Cl.³ A61G *7/08*
U.S. Cl. 5—82 R **3 Claims**



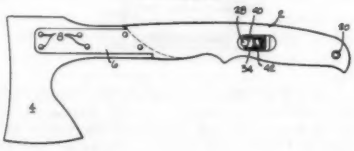
1. A spine board having openings with attachment means for receipt of hooks carried on a securing strap adapted to pass around a patient's torso to secure the torso to the board; comprising:
(a) a board having a substantially rectangular configuration with openings adjacent the opposite edges of the board;
(b) securing means comprising handles in the board openings;
(c) a hook and strap combination;
(d) said strap having a buckle on one free end and a catch on the other free end;
(e) a plurality of hooks carried on strap and freely slidable thereon;
(f) said hooks adapted to engage said handles with the strap passing about a patient's torso and with the buckle and catch locked, the strap being freely tightened to secure the torso to the board; and
(g) at least one of said hooks is permanently fixed to said strap with at least three remaining hooks being feely slidable on the strap.

4,519,107
BOXSPRING HAVING COIL COMPRESSION STOPS
Paul J. Dillon, Atlanta, and Walter Stumpf, Dunwoody, both of Ga., assignors to Simmons U.S.A. Corporation, Atlanta, Ga.
Filed Jul. 8, 1983, Ser. No. 512,099
Int. Cl.³ A47C *23/08*
U.S. Cl. 5—261 **10 Claims**



1. A boxspring comprising:
a frame;
a support surface for supporting a mattress;
spring means including a plurality of coil springs mounted to said frame and resiliently supporting said support surface; and
stop means including a plurality of hollow cylindrical stop members positioned respectively about a plurality of said coil springs and between said frame and said support surface for limiting the potential compression of said spring means, said stop means having a height sufficient to prevent overstressing of said spring means when a load is applied to said support surface.

4,519,108
COMBINATION TOOL
Donald E. Hodgson, 9081 Tahoe, Boulder, Colo. 80301
Filed Sep. 9, 1983, Ser. No. 530,511
Int. Cl.³ B25G *1/08*
U.S. Cl. 7—167 **11 Claims**



1. A tool comprising:
a handle;
a head attached to one end of said handle, said head extending in a direction generally perpendicular to the longitudinal axis of said handle;
said head having tool means formed thereon;
a longitudinally extending cavity in said handle;
support means located in said handle adjacent the other end thereof with a portion of said means located in said cavity;
a cutting tool;
means for mounting said cutting tool in said cavity, said

means also allowing said cutting means to be completely removed from said cavity and said handle;

said means comprising a cutout adjacent one end of said cutting tool, said cutout cooperating with said portion of said support means in said cavity to support said cutting tool when said cutting tool is mounted in said cavity;

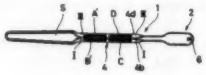
said support means and said cutout cooperating to form means for permitting pivotal movement of said cutting tool into or out of said cavity; and

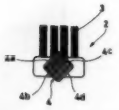
means for locking said cutting tool in position in said cavity.

4,519,109
TOOTH BRUSH

Beach D. Raymond, 8-20, Wada-cho, Atami-shi, Shizuoka-pref, Japan

Filed Apr. 16, 1984, Ser. No. 601,020
Int. Cl.[3] A46B 9/04, 5/02
U.S. Cl. 15—110 **3 Claims**





1. A toothbrush comprising

a handle extending in a plane;

a base structure having two sides and extending from said handle in said same plane;

a set of brushes attached to one side of said base and disposed to be perpendicular to said plane;

a protrusion disposed on the other side of said base;

wherein said handle has a holder portion comprising a front portion and a rear portion, said front portion being closest to said brushes;

wherein said front portion and said rear portion each has four inclined surfaces positioned at right angles to next adjacent surfaces, with at least a pair of next adjacent surfaces being at substantially 45° angle to a plane perpendicular to said plane of said base;

wherein each of said surfaces in said front portion has a different mark, and each of said surfaces in said rear portion has a different mark, with said marks in both front portion and said rear portion corresponding to thumb and first finger of a person holding said toothbrush when brushing selected parts of the mouth of said person and being as follows, as viewed from along the plane of said base towards said brushes;

front portion; left upper surface, first mark; right upper surface, second mark; right lower surface, third mark; and left lower surface, fourth mark;

rear portion; left upper surface, said third mark; right upper surface, said fourth mark; right lower surface, said first mark; and left lower surface, said second mark;

wherein for a right hand, said front portion is for placement of a thumb, and said rear portion is for placement of a first finger, with placement of said thumb on a certain marked surface of said first portion, and placement of said first finger on a surface of corresponding mark, for brushing the following locations of said teeth in said mouth;

first mark, upper jaw left outside surface of said teeth and upper jaw right inside surface of said teeth; second mark, lower jaw left outside surface of said teeth and lower jaw right outside surface of said teeth; third mark, lower jaw left inside surface of said teeth and lower jaw right inside surface of said teeth; and fourth mark, upper jaw right inside surface of said teeth and upper jaw left outside surface of said teeth.

4,519,110
BRUSH

Matvei Rubin, 89-11 63 Dr., Rego Park, N.Y. 11374

Filed Jan. 9, 1984, Ser. No. 569,497
Int. Cl.[3] A46B 9/02
U.S. Cl. 15—159 R **7 Claims**

1. A brush, comprising

a supporting portion having an uninterrupted surface with a predetermined outer contour and elongated in a first direction said supporting portion having a portion thereof adapted to be held by a person's hand during use, said surface facing a user;

a plurality of sets of bristles extending beyond said surface and arranged on said supporting portion so that each of said sets of bristles has a contour forming a letter and/or a numeral, and said sets of bristles are spaced from one another so as to form meaningful word and/or expression, only by said bristles and not by said supporting surface; the area of the supporting portion defined by the space between said sets of bristles being devoid of bristles and

two rows of bristles extending in said first direction and located at opposite sides of said letters and/or numerals, as considered in a second direction which is transverse to said first direction so as to provide a continuous line of bristles in said first direction and to maintain the brushing effect despite the spaces between said sets of bristles.

4,519,111
TOOTHBRUSH HAVING SERIES OF BRISTLES OF DIFFERENT HEIGHT

Paolo Cavazza, Viale dell'Umanesimo 178, Rome, Italy

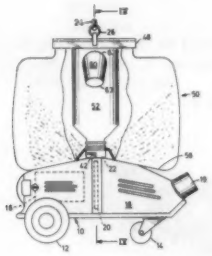
Filed Oct. 26, 1982, Ser. No. 436,706
Claims priority, application Italy, Nov. 6, 1981, 36121/81[U]
Int. Cl.[3] A46B 9/04
U.S. Cl. 15—167 R **2 Claims**

1. A toothbrush having the bristles grouped into tufts arranged in parallel rows, characterized in that the bristles as a whole (7) consist of a first series of tufts (5^1, 5^2, 5^3 . . .) whose height becomes greater the more distant they are from the end of the toothbrush opposite to the handle, and of a second series of tufts (6) of constant height, which alternate regularly with the tufts of bristles of the first series.

4,519,112
MUFFLED VACUUM CLEANER

John F. Bevington; Paul Meeker, both of Toledo, and Michael Savidge, Oregon, all of Ohio, assignors to The National Super Service Company, Maumee, Ohio

Filed Nov. 7, 1983, Ser. No. 549,067
Int. Cl.³ A47L 9/14
U.S. Cl. 15—326 7 Claims

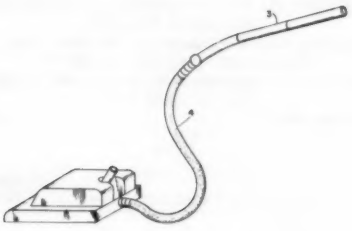


1. A muffled vacuum cleaner comprising:
(1) a motor and motor-driven fan in a housing,
(2) an outlet from said fan directed upwardly from said housing,
(3) a dirt-collecting flexible porous bag removably connected at its bottom to said outlet,
(4) a flexible non-porous tube in said bag connected at its lower end to the connection of said bag to said outlet, and connected at its upper end to the top of said bag, said tube having adjacent its top a tubular extension that extends outwardly and downwardly at at least 100° with the longitudinal vertical axis of said tube, said extension having a first end of larger cross-sectional area than the second end, said larger cross-sectional area end being connected to a correspondingly large opening in said tube, whereby said tube and its extension in said bag muffles the air noise from said fan.

4,519,113
TRANSFORMING THE UPRIGHT VACUUM CLEANER'S OWN PUSH-PULL HANDLE INTO A SUCTION CLEANING WAND

Robert J. Hipple, 2005 E. Maryland Ave., St. Paul, Minn. 55119

Filed Jul. 2, 1982, Ser. No. 394,859
Int. Cl.³ A47L 5/32
U.S. Cl. 15—335 1 Claim

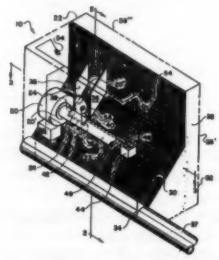


1. An upright vacuum cleaner having a tubular push-pull handle consisting of one or more hand-separable sections, said push-pull handle being hand-detachable at its base end from an air-tight socket assembly which is affixed to said vacuum cleaner and the opposite end of said push-pull handle being attached to one end of a flexible hose and the other end of said flexible hose leads to and has access to said vacuum cleaner's suction power system, said flexible hose combined with the tubing of said push-pull handle thus being the means of transferring said suction power of said vacuum cleaner to the detached base of said push-pull handle and thereby transforming said push-pull handle into a suction cleaning wand with the length of said cleaning wand being determined by the number of sections left attached to said flexible hose.

4,519,114
APPARATUS AND METHOD FOR CLEANING TEXTILE FIBER

Ralph H. Rhyne, Belmont, N.C., assignor to Rhyne Fibers, Inc., Belmont, N.C.

Filed Dec. 15, 1982, Ser. No. 450,139
Int. Cl.³ D01G 1/00
U.S. Cl. 19—200 14 Claims



1. In an apparatus for cleaning textile fibers comprising a substantially enclosed cleaner housing having a perforated interior dividing wall separating said housing into a trash accumulating chamber and a fiber accumulating chamber, the perforations of said dividing wall being of a selected size sufficient for passage therethrough of debris on said fibers but to prevent passage therethrough of said fibers, fiber directing means associated with said cleaner housing for directing said fibers into said fiber accumulating chamber in a direction toward said dividing wall, and pneumatic conveying means associated with said airstream directing means upstream of said fiber accumulating chamber for creating a moving airstream for entraining said fibers therein and impelling said fibers through said airstream directing means into said fiber accumulating chamber for impact with said dividing wall to cause separation of said debris from said fibers by passage of said debris with said airstream through said perforations into said debris accumulating chamber and retention of said fibers in said accumulating chamber, the improvement comprising a pair of planar deflecting vanes pivotably mounted in said housing on opposite sides of said airstream directing means and operably connected for reciprocatory movement in generally parallel relation for reciprocably directing said fiber entrained airstream back and forth across the transverse extent of said dividing wall, whereby said fiber entrained airstream is continuously diverted away from said fibers following their impact against said dividing wall to prevent extended or progressive accumulation of said fibers on said dividing wall under the retaining impetus of said fiber entrained airstream and to permit said fibers to gravitationally fall from said dividing wall following said impact thereagainst.

4,519,115
METHOD OF THREADING A THREAD INTO A TEXTURING NOZZLE

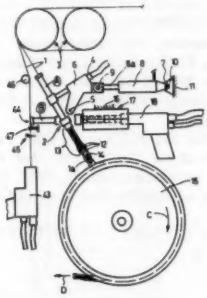
Peter Gujer, Winterthur; Dieter Guldenfels, Dinhard; Armin Wirz, Ossingen, all of Switzerland; Hans Knopp, Ludwigshafen, Fed. Rep. of Germany; Dieter Herion, Frankenthal, Fed. Rep. of Germany, and Gerhard Conzelmann, Otterstadt, Fed. Rep. of Germany, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Division of Ser. No. 185,906, Dec. 11, 1979, Pat. No. 4,416,041. This application Mar. 21, 1983, Ser. No. 477,317

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817487; European Pat. Off., Mar. 24, 1979, 79/00019

Int. Cl.³ D02G *1/12, 1/16*

U.S. Cl. 28—255 **1 Claim**



1. A method of threading threads into at least two texturing nozzles movable between a texturing position and a threading-in position comprising the steps of

moving each nozzle from said texturing position into said threading-in position;

drawing air simultaneously through a treatment chamber within each nozzle to draw air into and through an inlet opening of each nozzle into the treatment chamber;

engaging at least two moving threads in a mobile suction device;

guiding each engaged thread at a right angle in front of the thread inlet opening of a respective nozzle in said threading-in position; and

cutting each thread between the mobile suction device and the respective inlet opening to permit the severed threads to be drawn through the respective inlet opening into the treatment chamber of a respective nozzle.

4,519,116
YARN TEXTURING BY MOVING CAVITY JET WITH FLUID REMOVAL

Leonard J. Aberle; Dong W. Kim; Robert Lees; Dick C. Vermeer, all of Chester; Ernest W. Wohnig, Petersburg, all of Va., and Samuel L. Yates, Columbia, S.C., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Mar. 16, 1983, Ser. No. 475,783

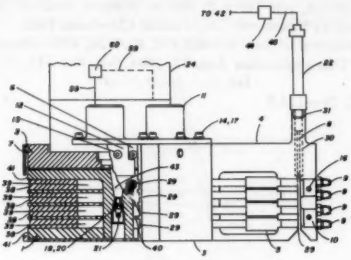
Int. Cl.³ D02G *1/12, 1/16*

U.S. Cl. 28—257 **4 Claims**

1. In a moving cavity texturing apparatus for texturing yarn comprising a texturing cavity having a barrier screen rotating in position to receive and transport as a textured wad said yarn entering said yarn texturing cavity and a yarn energy tube communicating with said texturing cavity to direct said yarn at high energy into said texturing cavity, said rotating barrier screen being mounted on a rotating wheel having a covering means for said rotating wheel, the improvement comprising

exhausting means for removing fluid from inside said covered rotating wheel and from areas at and adjacent to said rotating barrier screen

thereby cooling any yarn present on said barrier screen, wherein the exhausting means is a turbine mounted within said covering means, said turbine controlled to rotate slowly so that



steam is deflected by turbine blades to outside the covering means for the rotating wheel, thereby preventing further disturbance of the wad of yarn on the barrier screen.

4,519,117
METHOD OF MAKING PROJECTILE

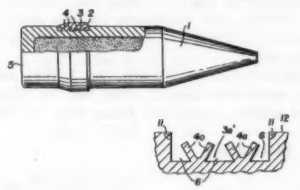
Udo Götz, Trossingen; Winfried Gleichauf, Oberndorf; Oswin Günther, and Dietrich Hoffmann, both of Schramberg, all of Fed. Rep. of Germany, assignors to Mauser-Werke Oberndorf GmbH, Fed. Rep. of Germany

Division of Ser. No. 435,500, Oct. 20, 1982,. This application Feb. 1, 1984, Ser. No. 576,014

Claims priority, application Fed. Rep. of Germany, Oct. 28, 1981, 3142636

Int. Cl.³ B21K *21/06*

U.S. Cl. 29—1.2 **2 Claims**



1. A method of manufacturing a projectile for automatic rapid firearms and high-performance machine guns, the projectile having a body with an axially extending outer circumferential surface, comprising:

cutting an annular groove into the circumferential surface of the body while leaving at least two radial ribs extending radially in the groove, which ribs have an axial width which is less than their radial length and leaving an intermediate groove between the ribs;

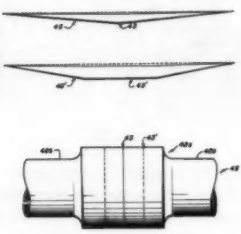
bending the ribs axially outwardly away from each other to form the ribs into a V-shaped configuration and applying knurling at least to one of the ribs and the intermediate groove; and

injection molding a pigmented, fiber-filled plastic into the annular and intermediate grooves and over the ribs for forming a rotating band having at least a portion extending radially outwardly of the outer circumferential surface of the body.

4,519,118
HOT MILL SELF-CENTERING ROLL DESIGN

George Shinopulos, Burlington, Mass.; M. Ronald Randlett, Bainbridge, and Terry F. Bower, Hudson, both of Ohio, assignors to Kennecott Corporation, Cleveland, Ohio

Continuation of Ser. No. 436,639, Oct. 26, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 642,727
Int. Cl.³ A01B *29/00*
U.S. Cl. 29—121.5 6 Claims

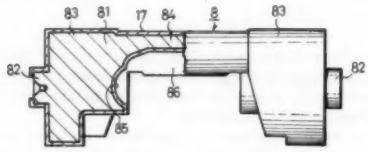


1. In a roll for hot rolling a continuously cast metallic strand into a substantially flat, narrow strip, the improvement comprising a central working portion that engages the strand and strip across the entire width of said strand and strip, the outer surface of said working portions having a longitudinal profile that is slightly concave with a maximum depth at the central region of the roll working portion with the depth of profile concavity being less than 0.3% of the maximum diameter of the roll such that after thermal stabilization there is a slight remaining concavity that produces a strip with slightly more metal at its center than at its edges to control the lateral location of the strand and strip on said working portion, said working portion having a larger diameter than adjacent end portions of the roll and a considerably shorter length than said adjacent end portions.

4,519,119
METHOD OF MANUFACTURING A PISTON FOR A SWASH PLATE TYPE COMPRESSOR

Shozo Nakayama, Kariya; Takamitsu Mukai, Anjo; Makoto Ohno, Kariya, and Mitsukane Inagaki, Anjo, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Continuation of Ser. No. 308,633, Oct. 5, 1981, abandoned. This application Jan. 27, 1984, Ser. No. 574,935
Claims priority, application Japan, Nov. 19, 1980, 55-163789
Int. Cl.³ B23P *15/10*
U.S. Cl. 29—156.5 R 6 Claims



1. A method of manufacturing a piston adapted for a compressor, comprising:

preparing a metal piston body having two axially aligned columnar portions at respective ends thereof, each columnar portion having at least one axial projection including an end surface,

cleaning the piston body to remove any dirt and oxide film therefrom,

applying a fluorine resin selected from an ethylene fluoride polymer and an ethylene fluoride-vinyl compound copolymer to the overall surface of the piston body except portions of the end surface of each projection, said fluorine resin having lesser thermal conductivity than that of the piston body,

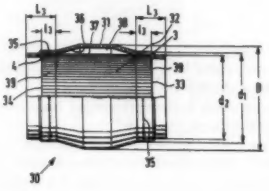
baking the piston body with the fluorine resin so that heat is gradually applied to the piston body evenly by passing through the exposed end surfaces of the projections as well as the surface of the piston body with the fluorine resin for positively bonding the resin onto the piston body without imparting strain and distortion to the piston body, and

cutting the projections after baking the piston body so that the height of each of the projections is equal to the thickness of the coating of the fluorine resin to make the end surfaces flat.

4,519,120
PROCESS FOR MANUFACTURING A CARTRIDGE FOR PURIFYING EXHAUST GAS

Manfred Nonnenmann, Schwieberdingen; Wolfgang Hesse, Remseck; Klaus Haller, Korntal, and Helmut Bardong, Stuttgart, all of Fed. Rep. of Germany, assignors to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co., Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 251,963, Apr. 7, 1981, Pat. No. 4,400,860, which is a division of Ser. No. 104,019, Dec. 17, 1979, Pat. No. 4,282,186. This application Sep. 30, 1982, Ser. No. 430,249
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2856030
Int. Cl.³ B01J *8/02;* B21D *39/02*
U.S. Cl. 29—157 R 21 Claims



1. A method for manufacturing a cartridge for purifying exhaust gases, comprising a catalyst support matrix wound metal foil and a metal jacket housing said support matrix, wherein an area of press fit is formed between the exterior of the support matrix and the interior of the jacket, with the jacket directly contacting the support matrix, and wherein the support matrix and jacket are secured together in the area of the press fit, said method comprising the steps of:

providing a hollow metal jacket;

inserting the wound support matrix into the jacket with a radial clearance between the matrix and the jacket;

thereafter reducing the diameter of at least a portion of the jacket and until an area of press fit is established between an outer surface of the support matrix and an inner surface of the jacket; and

securing the support matrix and the jacket to each other by welding in the area of said press fit.

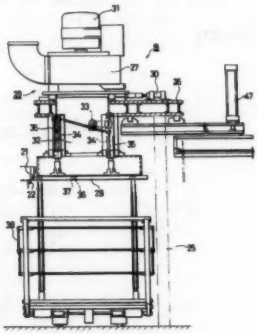
4,519,121
METHOD OF AND APPARATUS FOR MOUNTING PLATE FINS OF HAIRPIN PIPES

Tomoo Yokosawa, Chiisagata, Japan, assignor to Hidaka Seiki KK, Japan

Filed Oct. 28, 1983, Ser. No. 546,672
Claims priority, application Japan, Nov. 30, 1982, 57-208504
Int. Cl.³ B21D *53/02*
U.S. Cl. 29—157.3 C 2 Claims

1. A method of mounting plate fins having punched holes on hairpin pipes, comprising the steps of:

(a) placing a multiplicity of hairpin pipes in upstanding disposition with open ends thereof directly upwardly in a mobile carriage in spaced relation at the same interval as that of the punched holes in the plate fins;
(b) thereafter positioning said mobile carriage in a position for mounting the plate fins on the hairpin pipes;
(c) aligning tiers of punched holes in a web which has been continuously fed along from a fin press;
(d) moving said web past a cutter blade by a distance equal to a desired number of tiers of punched holes in the web while said web is being held under suction by a pressure plate;
(e) cutting said web into a plate fin with said cutter blade while said web is being held under suction by a pressure plate;



(f) moving said pressure plate with the cut-off plate fin held thereby horizontally in a direction away from said cutter blade;
(g) releasing said plate fin from said pressure plate to allow said plate fin to drop onto said mobile carriage until said hairpin pipes are inserted through the punched holes in the plate fin;
(h) moving said pressure plate back to an original position prior to the movement away from said cutter blade;
(i) repeating said steps (c) through (h) a predetermined number of times;
(j) lowering said pressure plate from said original position to depress said plate fins along said hairpin pipes toward lower ends thereof; and
(k) repeating said steps (c) through (j) until a prescribed number of plate fins are stacked on said hairpin pipes.

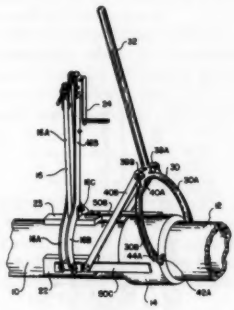
4,519,122

PULLER MECHANISM FOR ASSEMBLING PIPELINES

Thomas P. Miller, 1322 Second St., #18, Santa Monica, Calif. 90401

Filed Apr. 18, 1983, Ser. No. 485,868
Int. Cl.³ B23P *19/04*
U.S. Cl. 29—237 **6 Claims**

1. A mechanism for moving the end of a first pipe into coupling engagement with an annular collar mounted on a second aligned pipe, said annular collar forming a shoulder with respect to said second pipe, said mechanism comprising: a first generally semi-circular yoke assembly including a pair of arcuate sections adapted to extend around the first pipe, the arcuate sections of said first yoke assembly being pivotally coupled to one another, said first yoke assembly further including two corresponding elongated sections extending upwardly from the arcuate sections, and a clamping mechanism mounted at the upper ends of said elongated sections to cause said pair of arcuate sections to be clamped to the first pipe; a second yoke assembly having an intermediate bight section and further having a pair of leg sections depending from said bight section and spaced from one another, said second yoke assembly being adapted to straddle the collar mounted on the second aligned pipe; a pair of arm members disposed on opposite sides of the first pipe and collar, each of said arm members being pivotally coupled at one end to the first yoke assembly, and being pivotally coupled at the other end to the second yoke



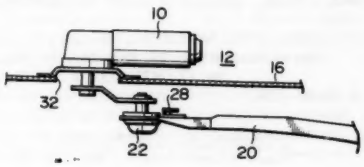
assembly; an elongated handle extending outwardly from the bight section of the second yoke assembly; and the legs of said second yoke assembly having respective ends configured to provide a fulcrum so that the first pipe and second pipe may be drawn together as the handle is turned with the end of the first pipe entering the collar.

4,519,123

METHOD OF MOUNTING VEHICLE WIPER MECHANISM

Kiyoyuki Imayoshi, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Feb. 4, 1983, Ser. No. 464,108
Claims priority, application Japan, Feb. 5, 1982, 57-017254
Int. Cl.³ B60S *1/08*
U.S. Cl. 29—434 **4 Claims**



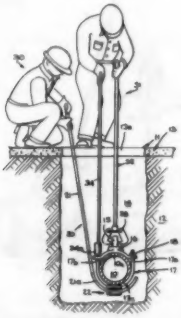
1. A method of mounting a vehicle wiper mechanism, the method comprising: inserting a wiper link into a cowl through an air duct hole provided in a cowl top, temporarily engaging a hook, provided in the vicinity of a rotary joint connector at one end of said wiper link, with an edge of an insertion hole in a cowl fore plate for receiving a wiper motor shaft, connecting a mating rotary joint connector on a crank fixed to a shaft of a wiper motor located on an engine compartment side of said fore plate to said rotary joint connector of the wiper link exposed through said insertion hole for receiving the wiper motor shaft, and, upon completion of said connection, disengaging said hook of the wiper link from the cowl fore plate, inserting the wiper motor shaft through said insertion hole, and affixing said wiper motor to the cowl.

4,519,124

METHOD OF POSITIONING A U-BOLT ON A CONDUIT

Stanley M. Burghardt, 94-20 Plattwood Ave., Ozone Park, N.Y. 11417

Filed Sep. 12, 1983, Ser. No. 531,430
Int. Cl.³ B23P *19/00*
U.S. Cl. 29—526 R **2 Claims**



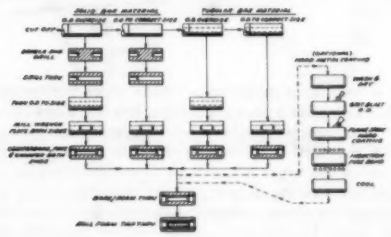
1. A method of positioning and holding a utility service saddle U-bolt, with its legs in an upright position, from beneath a utility conduit in position in a deep excavation for receiving and attaching the saddle thereto while standing at ground level adjacent to the deep excavation whose area of opening is too small for a person to enter, and within and near the bottom of which said utility conduit is exposed, comprising the steps of temporarily clamping said U-bolt in a clamp at a location substantially mid-way along its length with the legs of the U-bolt projecting upward with respect to the clamp while providing an extension handle extending from said clamp first in a direction towards and beyond one of said U-bolt legs and then substantially in said upward direction of projection of said U-bolt legs, and using said extension handle to move said U-bolt into said excavation and beneath said utility conduit, and thence upwardly whereby said upward projecting U-bolt legs are respectively positioned adjacent to said conduit on either side thereof.

4,519,125

SUCKER ROD COUPLING MANUFACTURING SYSTEM

Ray E. Colonius, Bloomfield Hills, and Edward Early, Romeo, both of Mich., assignors to Cargill Detroit Corp., Clawson, Mich.

Continuation of Ser. No. 323,967, Nov. 23, 1981, abandoned. This application Dec. 15, 1983, Ser. No. 561,660
Int. Cl.³ B23P *13/00*
U.S. Cl. 29—558 **16 Claims**



1. Production method for manufacturing sucker rod couplings comprising the steps of

clamping the finished O.D. of a tubular workpiece cut to length with finishing end stock at a coupling end machining station,

counterboring, facing and chamfering each coupling end while the coupling is clamped on the finished O.D.,

reclamping said finished O.D. at a boring station,

through boring the tubular I.D. at said boring station,

using a pilot extension on a boring bar engageable with a pilot guide means at said boring station,

reclamping said finished O.D. at a threading station,

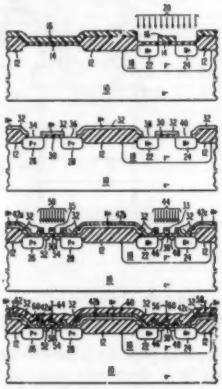
and roll threading said I.D. through said coupling.

4,519,126

METHOD OF FABRICATING HIGH SPEED CMOS DEVICES

Sheng T. Hsu, West Windsor Township, Mercer County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Dec. 12, 1983, Ser. No. 560,459
Int. Cl.³ H01L *21/283*
U.S. Cl. 29—571 **5 Claims**



1. A process for fabricating integrated circuits each having buried drain and source contact regions of a first conductivity type at the surface of a body of monocrystalline silicon of a second conductivity type, the surface having a layer of insulator material thereon, comprising the sequential steps of:

depositing a buffer layer of polycrystalline silicon over the layer of insulator material;

etching contact openings in both the layer of polycrystalline silicon and in the layer of insulator material thereunder to expose portions of the buried contact regions;

further etching only the layer of polycrystalline silicon to expose portions of the layer of insulator material to form gate members and interconnect portions; and

forming a layer of refractory metal silicide on the interconnect portions of the polycrystalline silicon layer, in the contact openings and on the gate member.

4,519,127

METHOD OF MANUFACTURING A MESFET BY CONTROLLING IMPLANTED PEAK SURFACE DOPANTS

Kazuhiro Arai, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

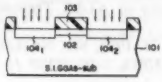
Filed Feb. 27, 1984, Ser. No. 583,746
Claims priority, application Japan, Feb. 28, 1983, 58-32424; Feb. 28, 1983, 58-32425
Int. Cl.³ H01L *21/324, 21/263*
U.S. Cl. 29—571 **32 Claims**

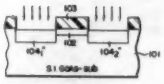
1. A method of manufacturing a metal semiconductor field-effect transistor (MESFET) by controlling implanted peak surface dopants, comprising the steps of:

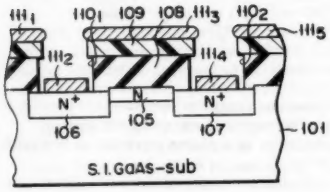
performing a first ion implantation of an impurity into a

portion of a semi-insulating substrate made of a compound selected from the group consisting of GaAs and InP, so as to form impurity ion-injection layers therein;

removing that portion of said impurity ion injection layers which extend from a surface thereof to a depth corresponding to a vicinity of a peak value of an impurity concentration distribution; and







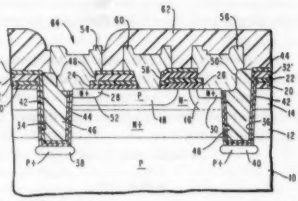
performing a second ion implantation of the impurity at least once from the surface of said remaining impurity ion injection layers to form high-concentration impurity ion injection layers, and thereafter annealing said layers to activate said high-concentration impurity ion injection layers to form source and drain regions.

4,519,128

METHOD OF MAKING A TRENCH ISOLATED DEVICE

Donald G. Chesebro, Colchester, and Francis J. Soychak, Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 5, 1983, Ser. No. 539,193
Int. Cl.[3] H01L *21/76*
U.S. Cl. 29—576 W **15 Claims**



1. A method of making a semiconductor device which includes the steps of:

forming a first layer of insulation on the surface of a semiconductor layer having a given conductivity type,

forming an opening in said first layer of insulation,

forming a diffusion region of a conductivity type opposite to that of said given conductivity type at the surface of said semiconductor layer through said opening to provide a P-N junction below the surface of said semiconductor layer,

forming in said semiconductor layer a trench having a sidewall located along a given plane through said opening and through said P-N junction,

forming an second layer of insulation on the sidewall of said trench, on said first layer of insulation and within said opening over said diffusion region,

etching with a dry etching process said second layer of insulation substantially only in the direction of said given plane to remove from said opening at least a portion of said second layer of insulation, and

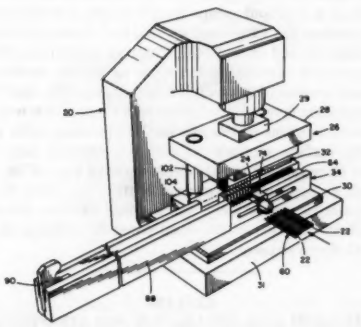
forming an ohmic contact on said diffusion region within said opening.

4,519,129

MASS TERMINATION CONNECTOR TO[illegible] ASSEMBLY

Jack E. Caveney, Hinsdale; Roy A. Moody, Flossmoor; John J. Bulanda, New Lenox, and Russell E. Wende, Hometown, all of Ill., assignors to Panduit Corp., Tinley Park, Ill.

Filed Sep. 9, 1982, Ser. No. 416,530
Int. Cl.[3] H01R *43/04*
U.S. Cl. 29—749 **16 Claims**



1. A tool assembly for use with a prime mover, such as a bench press, for terminating a plurality of insulated conductors in a mass termination connector having a plurality of insulation displacement terminal elements corresponding to said conductors, said tool assembly comprising:

a pair of supports, at least one of which includes means for attachment to said prime mover to effect reciprocal movement of one of said support relative to the other of said supports;

a conductor insertion die set, comprising an insertion die corresponding to each connector terminal element, carried by one of said supports for inserting said conductors into corresponding terminal elements of said connector;

connector holding means carried by the other of said supports for holding said connector in alignment with said die set, said holding means including a channel for seating the connector to be terminated, said channel being defined by a front wall, rear wall, and a floor extending between said walls, said rear wall including a window; and

connector release means for retaining said connector in said holding means, said release means having a connector retention position and a connector release position, said release means being biased to said retention position, whereby moving said connector sufficiently to overcome the bias results in release of said connector from said holding means, said connector holding means comprising an arm extending through said window and positioned to interfere with attempted removal of a connector located in said channel.

4,519,130

TOOL FOR REMOVING AN ELECTRONIC SLIDE-IN UNIT FROM A FIXING RACK

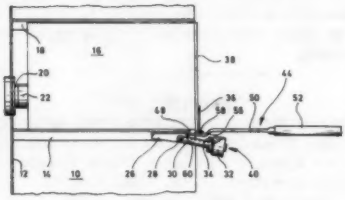
Lothar F. Schaefer, Hummelbaum 22, D 7263 Renningen, Fed. Rep. of Germany

Filed Feb. 1, 1983, Ser. No. 462,940

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1982, 8202450[U]

Int. Cl.³ H05K *13/04, 3/36*

U.S. Cl. 29—764 **16 Claims**



1. A tool for removing an electronic slide-in unit from a fixing rack, comprising an extracting section which engages in a front panel of the slide-in unit, a supporting section which engages in a rack and means for producing a relative movement between the extracting section and the supporting section, characterized in that the extracting section and the supporting section are formed by opposing surface sections of a rigid cam element **(48)** which is fixedly carried by the free end of an operating lever **(5)** so that the cam element axis is substantially perpendicular to the axis of the operating lever **(5)** the opposing surface sections of said cam element thus (being adapted to engaging) a member **24** forming part of the fixing rack and an opposing end portion of the front panel **38** of the slide-in unit **16**, respectively, said member **24** of the fixing rack and said end portion of the front panel **38** defining an interspace **42** therebetween.

4,519,131

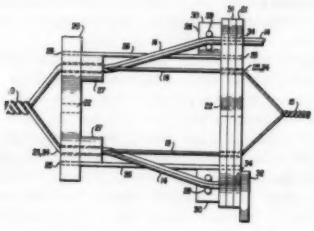
METHOD AND APPARATUS FOR STRIPPING MULTIPLEX WIRE AND CABLE

Ralph E. Starnes, Jr., and Danny P. Carden, both of Carroll County, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Jul. 1, 1983, Ser. No. 510,047

Int. Cl.³ H01R *43/00*

U.S. Cl. 29—825 **7 Claims**



1. The method of continuously removing insulation from conductors of multiplex cable, comprising the steps of:

supplying lengths of insulated multiplex cable;

advancing each insulated strand of the multiplex cable along a straight path parallel to a predetermined longitudinal axis;

continuously removing insulation from said insulated strands in one or more lengths while in said straight path;

directing said insulation away from said longitudinal axis;

plexing each conductor around said longitudinal axis; and

collecting bare multiplex cable on storage means.

4,519,132

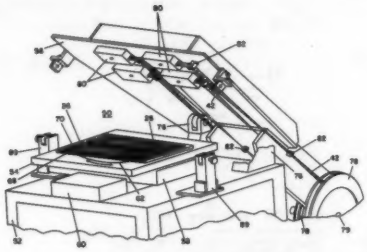
HIGH SPEED CONTACT INSERTION FACILITY

Gary E. Kleinedler, Hillsborough Township, Somerset County, and Herbert A. Pohl, Raritan Township, Hunterdon County, both of N.J., assignors to AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,465

Int. Cl.³ H05K *3/00;* **B23P** *19/02*

U.S. Cl. 29—845 **4 Claims**



1. A method of inserting elongated contacts into cavities in connector housings, the method comprising the steps of:

positioning the housings in a planar array on an indexable table;

simultaneously indexing a plurality of strips of contacts past a respective plurality of contact insertion heads;

simultaneously activating the insertion heads to insert a contact from each strip into a cavity of a different connector housing in the array; and

continuously indexing and rotating the array of connector housings and inserting contacts into cavities therein until contacts have been inserted into predetermined cavities of the connector housings.

4. A machine for inserting elongated contacts into cavities in a planar array of connector housings, comprising:

a superstructure;

a plurality of contact insertion heads located on said superstructure and positioned proximate the planar array of connector housings;

means operatively associated with said superstructure for simultaneously indexing each of a plurality of strips of contacts proximate to a respective plurality of insertion heads;

means operatively associated with said indexing means for simultaneously activating the heads to urge a contact from each strip into a cavity of a different connector housing in the array; and

means operatively associated with said activating means for continuously indexing the array of connector housings to insert contacts into cavities therein until contacts have been inserted into predetermined cavities of the respective connector housings.

4,519,133

METHOD OF, AND APPARATUS FOR, TERMINATING A CONDUCTOR OF A FLAT FLEXIBLE CABLE

Jean C. Pansanel, Herblay, France, assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 29, 1983, Ser. No. 508,954

Claims priority, application France, Jul. 15, 1982, 82 12385

Int. Cl.³ H01R *4/16*

U.S. Cl. 29—863 **8 Claims**

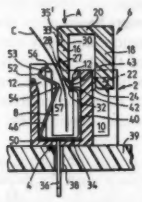
1. A method of terminating a conductor of a flat flexible film cable to an electrical terminal said terminal having a resiliently

deflectable arm upstanding from a base portion of the terminal and a contact surface remote from the base portion; the method comprising the steps of:

inserting the conductor adjacent said terminal,

inserting a camming element between the contact surface and an abutment opposite thereto and spaced therefrom,

urging said conductor against the contact surface by means of said camming element and thereby elastically and plastically deflecting the arm by movement of the contact surface away from the abutment by a distance at least



equal to the thickness of the cable, the resistance of the arm to its plastic deflection once the elastic limit of the arm has been overcome being less than the resistance to its elastic deflection, prior to said elastic limit being overcome, such deflection being to an extent to render the final contact force exerted against the conductor sensibly independent of the cable thickness with the conductor exposed, that is the final contact force increases by no more than 2 to 3.5N over the range of thickness concerned, which thickness does not exceed about "0.4 mm".

4,519,134

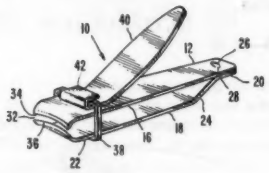
FINGERNAIL CLIPPING DEVICE

John Bumbera, 4 Stanworth La., Allentown, N.J. 08501

Filed Apr. 26, 1984, Ser. No. 604,244

Int. Cl.³ A45D *29/02*

U.S. Cl. 30—28 **13 Claims**



1. A fingernail clipping device comprising:

(a) an upper frame member defining a first upper end means and a second upper end means;

(b) a lower frame member secured with respect to said upper frame member, said lower frame member including a first lower end means and a second lower end means, said first lower end means and said first upper end means being secured with respect to one another, said lower frame member extending outwardly with respect to said upper frame member from the location of securement with said second lower end means being spatially disposed adjacent said second upper end means, said upper frame member and said lower frame member being movable with respect to one another to selectively abut said second upper end means and said second lower end means, said lower frame member and said upper frame member defining a central opening therebetween;

(c) a cutting means comprising:

(1) an upper cutting member fixedly secured with respect to said second upper end means of said upper frame means; and

(2) a lower cutting member fixedly secured with respect to said second lower end means of said lower frame means;

(d) a peripheral retaining means extending about the outer surfaces of said second upper end means and said second lower end means to restrict positioning of said said upper end means and said second lower end means to be adjacent and selectively spatially disposed with respect to one another; and

(e) an arm means secured pivotally with respect to said peripheral retaining means adjacent to said upper frame member, said arm means including an abutment surface in contact with said upper frame member allowing movement of said upper cutting means into contact with said lower cutting means for fingernail cutting responsive to movement of the outer end of said arm means toward said upper frame member.

4,519,135

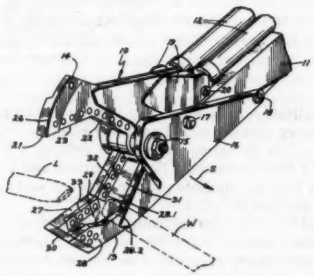
METAL DEMOLITION SHEAR

Roy E. LaBounty, 1607 8th Ave., Two Harbors, Minn. 55616

Filed Sep. 13, 1982, Ser. No. 416,902

Int. Cl.³ B23P *19/00*; E02F *3/28*

U.S. Cl. 30—134 **22 Claims**



1. A heavy duty shear for attachment to the boom structure and hydraulic system of a backhoe, comprising

a lower jaw and an upper jaw and pivot means interconnecting the jaws together, the lower jaw having frame means for attachment to the boom structure of the backhoe and the upper jaw having means for attachment to the hydraulic system of the backhoe for closing and opening the upper jaw relative to the lower jaw,

the lower jaw and the upper jaw having rigid lower and upper shear blades extending along each other and having a thickness and a width greater than the thickness to provide strength for shearing a workpiece of such scrap metal when the upper blade is closed onto the lower shear blade,

the upper and lower shear blades having inner and outer workpiece engaging edge portions opposite each other and also having intermediate portions between said inner and outer edge portions, the inner and outer edge portions of the upper shear blade extending obliquely of each other,

the lower jaw also having a rigid guide blade lying along the shear blade and in spaced relation therewith, the outer ends of the shear and guide blades being adjacent each other, rigid means securing the outer ends of the lower shear blade and the guide blade together,

the guide blade having a top surface extending from its outer end and toward the pivot means, said top surface having an outer end disposed directly opposite the cutting edge of the lower shear blade at the outer ends of the lower shear and guide blades, the upper shear blade traversing the lower shear blade and traversing the guide blade at the outer end of the top surface in a shearing motion, and said

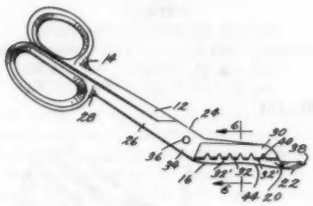
top surface also having support portions extending along both the inner and outer edge portions of the lower shear blade, and said support portions being spaced below the cutting edge of the lower shear blade by a distance at least as great as the approximate thickness of the lower shear blade to be normally spaced below a workpiece on the shear blade to receive and support the workpiece after the workpiece is severed by the shear blades.

4,519,136

SHELLFISH CUTTING AND EATING IMPLEMENT

Ernest D. Walker, 2116 Falling Creek Rd., Silver Spring, Md. 20904

Filed Feb. 27, 1984, Ser. No. 583,870
Int. Cl.³ A22C *29/02*; B26B *13/22*
U.S. Cl. 30—142 **8 Claims**



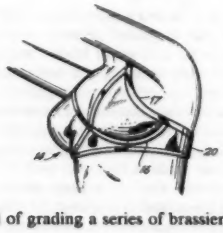
1. A shellfish cutting and eating implement comprising:
a first lever member including a first elongated handle portion, a first elongated jaw portion defining a first cutting edge a first substantially flat side surface and a flared end, and a first intermediate portion between said handle portion and said jaw portion;
a second lever member including a second elongated handle portion, a second elongated jaw portion defining a second notched cutting edge,and a second intermediate portion between said second handle portion and said second jaw portion: and
means in operative relationship with said first and second intermediate portions for pivotally connecting together said first and second lever members to enable said first and second cutting edges to be selectively moved in shearing relationship with each other;
said flared end being substantially flat and substantially perpendicular to said first flat side surface and defining a pointed forward end.

4,519,137

BRASSIERE

Dolores O'Boyle, Woodridge, and Phyllis Shonk, Glen Rock, both of N.J., assignors to International Playtex, Inc., Stamford, Conn.

Continuation of Ser. No. 422,611, Sep. 24, 1982, abandoned, which is a division of Ser. No. 219,111, Dec. 22, 1980, Pat. No. 4,393,875. This application Feb. 29, 1984, Ser. No. 584,900
Int. Cl.³ A41H *3/06*
U.S. Cl. 33—17 R **1 Claim**



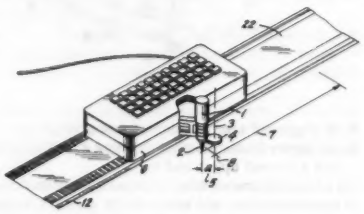
1. A method of grading a series of brassieres of like styling for women having the same body dimension except for breast sizes, based upon measurements of one woman having average sized breasts for said series of brassieres in which each brassiere includes a pair of breast receiving cups for supporting the breasts of a woman, and body encircling components associated with said pair of breast receiving cup and sized to fit around the body of each woman, said method comprising the steps of:
measuring the diaphragm dimension and body chest dimension of a woman having average sized breasts for said series of brassieres;
determining by formula the breast size of said woman having average sized breasts based upon the measurements of the diaphragm dimension and body chest dimension; and
reducing the size of the breast receiving cups while maintaining substantially the same the length of the body encircling components to accommodate a desired breast size for a second woman having less than the determined average breast size by:
(a) reducing the depth dimension of the breast receiving cups in accordance with the reduction from said determined average breast size to said desired breast size for said second woman; and
(b) reducing the overall perimeter of the breast receiving cups in accordance with said desired breast size for said second woman by
(1) maintaining substantially the same the lower arcuate extent of the breast receiving cups so that the length of the body encircling components remains substantially the same; and
(2) reducing the remainder of the perimeter of the breast receiving cups to said desired breast size for said second woman.

4,519,138

AUTOMATIC DRAFTING DEVICE WITH ADJUSTING AID

Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 487,204
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214760
Int. Cl.³ B43L *24/00*
U.S. Cl. 33—32 R **8 Claims**



1. An automatic drafting device comprising:
a carriage having stylus means mounted thereon for writing upon a planar drawing surface, said stylus including a writing tip;
a toothed rack having said carriage mounted thereon;
toothed wheels on said carriage engaging with said toothed rack for moving said carriage and said stylus means along said planar drawing surface;
means controlling movement of said stylus means relative to said carriage for controlling writing by said writing tip on said drafting surface;
adjusting aid means on said carriage arranged at said stylus means in close proximity to said writing tip for determining a writing position; and

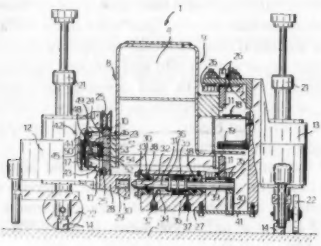
compensating control means for automatically compensating for the distance between said writing position and said writing tip when said distance is greater than zero by effecting displacement of said writing tip through a compensating distance equal to said distance between said writing position and said writing tip to bring said writing tip to said writing position.

4,519,139

DEVICE FOR AUTOMATIC MARKING OUT AND DIVIDING UP OF A FLAT SHEET OF GLASS WHICH CAN BE POSITIONED UPSTREAM OF A SHEET CUTTING LINE

Leonardo Ghinamo, Boves, Italy, assignor to Bottero S.p.A., Cuneo, Italy

Filed May 31, 1984, Ser. No. 616,015
Claims priority, application Italy, Jun. 14, 1983, 67655 A/83
Int. Cl.³ C03B *33/10*
U.S. Cl. 33—32 C 11 Claims



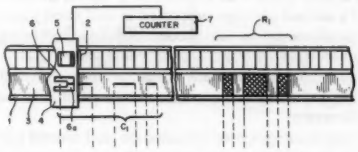
1. A device (1) for automatically marking out and dividing up a sheet of flat glass (2), in particular one which can be introduced upstream of a line for cutting the glass (2) itself, for forming rectilinear incisions thereon, of the type comprising a support platform (3) for the said sheet (2) and at least one crosspiece (4) relatively movable with respect to the said platform (3) along a first axis carrying a plurality of carriages (12,13) movable on the said crosspiece (4) along a second axis perpendicular to the first and each provided with an associated tool (14) for forming scored incisions on the said sheet (2), first carriages (12) being slidably mounted along first guides (10) on a first side (18) of the said crosspiece (4) for scoring the said sheet (2) along the said first axis and a second carriage (13) being slidably mounted along second guides (11) on a second slide (9) of the said crosspiece (4), opposite the first, for scoring the said sheet (2) along the said second axis, characterised by the fact that the said second carriage (13) is provided with actuation means (15) for displacing it along the said crosspiece (4) and with positioning means (20) for establishing at each instant the position of the said second carriage (13) and stopping it in predetermined positions, and in that the said second carriage (13) carries releasable engagement means (31) operable to cooperate with associated coupling means (29) for each said first carriage (12) for selectively displacing the first carriages (12) along the said crosspiece (4) together with the said second carriage (13).

4,519,140

SYSTEM FOR IDENTIFYING REFERENCE MARKS IN A PATH MEASURING DEVICE

Walter Schmitt, Traunreut, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Oct. 28, 1982, Ser. No. 437,488
Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144334
Int. Cl.³ G01B *11/02*
U.S. Cl. 33—125 C 11 Claims



1. In an incremental path measuring instrument of the type comprising a scale, an incremental measuring division defined by the scale, a reference track defined by the scale which defines a plurality of identical reference marks, means for scanning the division and the reference track in parallel and dynamically generating output signals in response to both the division and the reference track during movement of the scanning means with respect to the scale, and means for evaluating the output signals, said evaluating means comprising a counter for counting output signals generated during and in response to scanning of the division as a measure of the position of the scanning means relative to the scale, the improvement comprising:

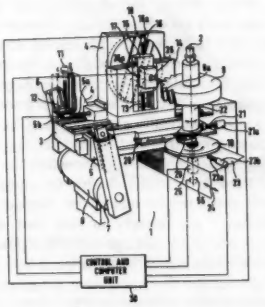
means for defining a plurality of code marks, each code mark serially associated with a respective one of the reference marks and distinctive from the other of the code marks such that each of the code marks unambiguously identifies the associated one of the reference marks, said code marks positioned such that the code marks are scanned by the scanning means in series with the reference marks.

4,519,141

GEAR PROBE

Willi Meder, Ettlingen; Hans-Ulrich Bertz, Rastatt, and Peter Golder, Ettlingen, all of Fed. Rep. of Germany, assignors to Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed Sep. 15, 1982, Ser. No. 419,031
Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136504
Int. Cl.³ G01B *7/28*
U.S. Cl. 33—179.5 R 3 Claims



1. A gear probe for testing the shape and orientation of tooth

flanks of a gear supported in the probe, comprising in combination:

(a) a probe frame;

(b) a first guide way supported on said probe frame;

(c) a first carriage supported on said first guide way for displacement parallel to a first direction;

(d) a first motor means connected to said first carriage for displacing said first carriage parallel to said first direction;

(e) a second guide way supported on said first carriage angularly adjustably in a plane parallel to said first direction;

(f) a third guide way oriented in a second direction;

(g) a second carriage supported in said third guide way for displacement in said second direction and being slidably connected with said second guide way;

(h) a second motor means connected to said second carriage for displacing said second carriage parallel to said second direction;

(i) a measuring sensor mounted on said second carriage;

(j) a third carriage supported on said first guide way for displacement parallel to said first direction;

(k) means for coupling said first carriage to said third carriage for transmitting displacement forces from said first carriage to said third carriage;

(l) a linear transmission track shiftably supported on said third carriage for a linear displacement with respect to said third carriage parallel to said first direction;

(m) a third motor means connected to said linear transmission track for displacing said linear transmission track with respect to said third carriage linearly and parallel to said first direction;

(n) a fourth carriage supported on said probe frame for displacement parallel to a third direction;

(o) a gear support mounted on said fourth carriage and having a rotary axis extending transversely to said first direction and parallel to said second direction and said plane; said gear support being arranged for supporting a gear to be tested, in an axial alignment with said rotary axis;

(p) a transmission disc mounted on said gear support in axial alignment with said rotary axis;

(q) a motor and shaft encoder unit connected to said gear support for rotating in unison said transmission disc and the gear to be tested;

(r) a fourth motor means connected to said fourth carriage for displacing said fourth carriage transversely towards and away from said third carriage for bringing said transmission disc in force-transmitting frictional engagement with or, respectively, moving said transmission disc away from said linear transmission track; and

(s) a control and computer means connected to said motor and shaft encoder unit and said first, second, third, and fourth motor means for automatically acutating said motor and shaft encoder unit for a coarse positioning of the gear flank to be tested with respect to said measuring sensor, further for automatically actuating said fourth motor means to establish frictional engagement between said transmission disc and said linear transmission track, further for automatically actuating said first motor means for displacing said first and second carriages to move said measuring sensor at least approximately in the vicinity of the gear flank to be tested, further for automatically actuating said third motor means for displacing said linear transmission track linearly in said first direction with respect to said third carriage for a fine positioning of the gear flank to be tested with respect to said measuring sensor and further for a selective automatic actuation of said first or second motor means for performing a measuring process by moving said measuring sensor on the gear flank to be tested.

4,519,142

BLADE HEIGHT CALIBRATION DEVICE

Eli H. Parker, 2314 E. 37th St., Savannah, Ga. 31404

Filed Jan. 28, 1983, Ser. No. 461,854

Int. Cl.³ B27G *23/00*

U.S. Cl. 33—185 R **13 Claims**

1. A device for calibrating the height of a blade above a blade drum surface of a blade drum on a machine comprising:

a. an upper section comprising a drum contact surface, sized and shaped to fit onto said blade drum surface of said blade drum of said machine;

b. a base section rigidly secured to said upper section and operative to be placed onto said machine;

c. stabilizing means securing said base section to said machine;

d. a notched opening in said drum contact surface of said upper section into which said blade may project when said drum contact surface rests on said blade drum surface;

e. adjustable electrical contact means projecting downward through said upper section into said notched opening and being aligned off-center in said opening and partially recessed into said upper section so that only a portion of the lower end of said electrical contact means is exposed within said notched opening; and

f. electrical indication means connected to said adjustable electrical contact means and to said blade, whereby when said adjustable electrical contact means contacts said blade, said electrical indication means is operative.

4,519,143

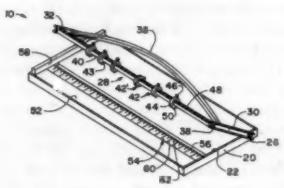
SHEET METAL BENDING POSITION MARKER SYSTEM

Antonino E. Correlli, 7919 35th St., Baltimore, Md. 21237

Filed Feb. 8, 1984, Ser. No. 578,060

Int. Cl.³ B23Q *35/02*; B23B *49/02*

U.S. Cl. 33—189 **18 Claims**



1. In a system for layout and marking of sheet metal on a base by a row of dies having respective points and means for holding the dies mutually parallel in adjustably slidable relation along die carrier rod pivoted relative points against and marking said sheet metal, the improvement comprising: means for causing said movement to move all said die points simultaneously against sheet metal, of any thickness within a range of thicknesses, including the pivoting of the die carrier rod by the

means for pivoting being about an axis parallel-spaced from the die-carrier rod.

4,519,144

THREAD MEASURING TOOL

Leif G. Larsen, Sibbevej 10, 3230 Graested, Denmark

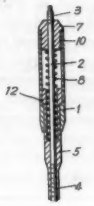
PCT No. PCT/DK83/00039, § 371 Date Dec. 12, 1983, § 102(e) Date Dec. 12, 1983, PCT Pub. No. WO83/03664, PCT Pub. Date Oct. 27, 1983

PCT Filed Mar. 28, 1983, Ser. No. 568,191

Claims priority, application Denmark, Apr. 16, 1982, 1698/82

Int. Cl.³ G01B *3/48*

U.S. Cl. 33—199 R **11 Claims**



1. A thread measuring tool comprising:

a hollow housing;

a hollow plug gauge holder slidably and rotatably positioned within the lower end of said housing;

shoulder means provided within said housing limiting the travel of said holder out of the lower end of said housing;

a spring positioned within said housing urging said holder towards said shoulder means;

a cap secured to the upper end of said housing;

a spindle extending through said housing from above the cap at the upper end of said housing to below the lower end of said holder, the spindle secured to said cap; and

a plug gauge provided at each end of said spindle.

4,519,145

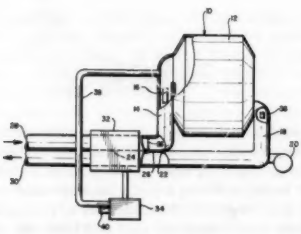
ELECTROSTATIC AND MOISTURE CONTROL SYSTEM FOR AUTOMATIC CLOTHES DRYERS

Sheldon W. Mandel, Galesburg, Ill., assignor to Magic Chef, Inc., Cleveland, Tenn.

Filed Mar. 12, 1984, Ser. No. 588,335

Int. Cl.³ F26B *3/04*

U.S. Cl. 34—27 **11 Claims**



7. A method of drying clothes in an automatic clothes dryer wherein the clothes are dried in a chamber provided with an air inlet and an air outlet by preheated air circulated through the chamber and controlled by sensing the temperature of the outlet air, the improvement comprising the steps of:

(a) condensing moisture from the outlet air;

(b) injecting the condensed moisture into the air inlet when the outlet air reaches a predetermined temperature, thereby eliminating the buildup of static electricity and permitting uniform drying of the clothes.

4,519,146

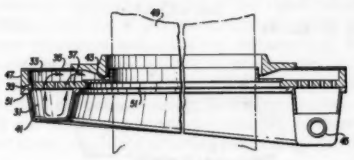
AIR RING PLENUM WITH MOLDED HOUSING

F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jun. 24, 1983, Ser. No. 507,368

Int. Cl.³ F26B *13/02*

U.S. Cl. 34—104 **16 Claims**



1. An air plenum for cooling an extruded tubular film comprising:

an annular chamber for surrounding a travel path of an extruded tubular film and having an annular outlet nozzle adjacent to the travel path for directing air towards a tubular film extruded along said travel path, said chamber including an annular air distribution plate forming a wall of said chamber and having a plurality of apertures spaced along its extent for receiving cooling air; and,

an annular one-piece molded channel-like housing connected to said distribution plate and defining an annular air flow path for feeding cooling inlet air into said apertures, said housing having a height and width defining a cross-sectional area and at least one air inlet for directing air tangentially into said housing; said cross-sectional area progressively decreasing from each said inlet along at least a portion of the annular extent thereof by decreasing the height of said housing progressively along its annular extent.

4,519,147

FOOTWEAR HAVING CUSHION CAVITY

Paul Jones, Jr., Falmouth, Me., assignor to Kayser-Roth Corporation, New York, N.Y.

Filed Jun. 1, 1982, Ser. No. 383,670

Int. Cl.³ A43B *9/12*

U.S. Cl. 36—19.5 **6 Claims**

1. A cement shoe comprising:

an upper including an upper member having margin portions;

a soft, flexible insole having margins, said margin portions of said upper overlapping and cemented to said margins of said insole;

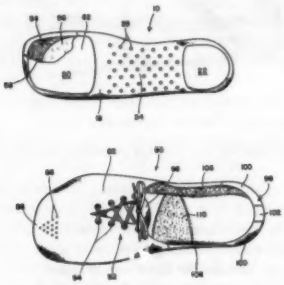
a wear resistant outsole including a peripheral cement margin, said cement margin defining a cavity within said outsole, said upper being cemented to said cement margin; and

a cushion within said cavity, said insole overlaying said cushion.

4,519,148
EXERCISE SHOE

Jann L. Sisco, 819 Country Club Dr., Sonoma, Calif. 94576

Filed Jul. 18, 1983, Ser. No. 514,873
Int. Cl.³ A43B *7/22*
U.S. Cl. 36—91 **15 Claims**

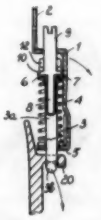


1. An exercise shoe, which comprises an upper and a sole fastened to said upper, said sole comprising first and second surface-gripping sole portions, said first and second sole portions being separated by a third, moisture-penetrable fabric sole portion, and a body of shock absorbent cushioning material positioned to be between said sole and at least a ball of a wearer's foot, said cushioning material terminating short of a toe end of said sole.

4,519,149
DEVICE FOR ADJUSTING THE FLEX IN REAR-ENTRY SKI BOOTS

Alessandro Pozzobon, Treviso, Italy, assignor to Nordica S.p.A., Montebelluna, Italy

Filed Aug. 16, 1982, Ser. No. 408,318
Claims priority, application Italy, Aug. 31, 1981, 22767/81[U]
Int. Cl.³ A43B *5/04*
U.S. Cl. 36—121 **6 Claims**



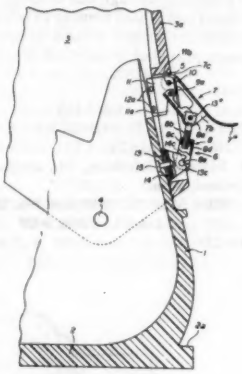
1. A device for adjusting the flex, particularly in rear-entry ski boots comprising within a receiving seat defined in the rear cuff of a ski boot settable elastic means connected to an engagement element protruding out of said receiving seat, said engagement element being adapted to engage, with said rear cuff in the closed position, with a retaining element provided rearwardly on the shell of said ski boot, wherein said engagement element is defined by the interconnecting portion of the arms of a substantially U-like link element accomodated inside said receiving seat and having coil springs arranged at the arms thereof, said coil springs acting between a reinforcement plate provided at the inside bottom of said receiving seat and a setting plate slidably supported on said arms of said link element, said setting plate having at a middle portion thereof a threaded hole wherein there engages a threaded shank defined at the bottom end of an adjusting pin protruding up from said receiving seat, wherein said adjusting pin has at a middle portion thereof a flange formation adapted to abut against a stop plate provided at the free top ends of said arms and secured thereon by locknuts mounted on the free ends of said arms of said link element.

4. In a rear-entry ski boot including a rear cuff member pivotally mounted on a rear portion of the ski boot shell, a device for biasing the forward lean movement of the ski boot, comprising a seat on said rear cuff member, an engagement element movably located in said seat and having a portion thereof protruding out of said seat, spring means in said seat for biasing said engagement element into its retracted position, and a retaining element on said rear portion of the ski boot shell adapted for releasable engagement with said protruding portion of said engagement element, thereby said spring means resiliently opposing said engagement element to be entrained into its extended position by said retaining element when forward lean of the ski-boot is exerted and resiliently urging said engagement element into its retracted position.

4,519,150
SKI BOOT

Simon Arieh, and Guy Courvoisier, both of Geneva, Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Jan. 21, 1983, Ser. No. 460,026
Claims priority, application Switzerland, Jan. 22, 1982, 395/82
Int. Cl.³ A43B *5/04*; A43C *11/14*
U.S. Cl. 36—121 **14 Claims**



1. In a ski boot having a lower member in the form of a casing formed with a sole piece and adapted to receive the foot of a skier, an upper member forming a cuff around the leg of the skier, means defining a pivot between said members substantially in the region of the ankle joint of the leg and foot, and latch means interconnecting said members, the improvement wherein said latch means comprises:

a toggle linkage having at least a pair of elements pivotally connected to one another at a first pivot;

means pivotally connecting one of said elements to said upper member at a second fixed on said upper member;

means pivotally connecting another of said elements to said lower member at a third pivot fixedly located on said lower member, said linkage having an actuating lever engaging said first pivot to shift the same toward and

away from the boot, said first, second and third pivots having mutually parallel pivot axes with said first pivot disposed between said second and third pivots; and

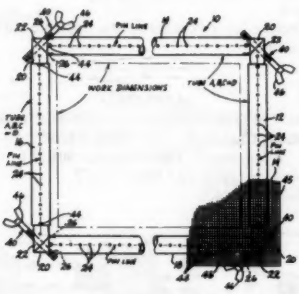
means on the boot forming an abutment, said toggle linkage being engageable with said abutment in a locking position of said linkage when said first pivot is displaced toward the boot, said toggle linkage having an unlocking position when said first pivot is displaced away from said boot, the angular displacement of said upper member relative to said lower member being limited in said locking position, said toggle linkage comprising a first link forming said element pivotally connected to said upper member at said second pivot, a second link pivotally connected to said lower member at said third pivot, said links being pivotally connected together at said first pivot, and an elastically deformable third link pivotally connected said first pivot and to said boot at a fourth pivot having an axis parallel to the axis of said first, second and third pivots and located in a seat formed in a member kinematically fixed to said upper member, said second, third and fourth pivots lying in a plane defining a metastable position of said linkage, said locking and unlocking positions lying to opposite sides of said plane, said elastically deformable third link constituting elastic means for ensuring bistable operation of said linkage.

4,519,151

EXPANDABLE AND CONTRACTIBLE FRAME FOR STRETCHING FABRIC MATERIAL, AND METHOD

Robert C. Johnson, Chagrin Falls, Ohio, assignor to Metalogic, Inc., Chagrin Falls, Ohio

Filed Nov. 3, 1983, Ser. No. 548,412
Int. Cl.³ D06C *3/08*
U.S. Cl. 38—102.9 **8 Claims**



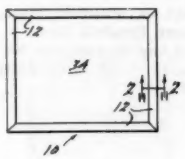
1. A relatively lightweight frame for stretching material, such as fabric material, adapted to be secured thereto, said frame comprising one-piece elongated, metal, defining side frame elements coupled together at their adjacent ends by a coacting pair of corner elements, said corner elements being selectively movable relative to one another so as to increase or decrease the frame size a selected amount, thus causing stretching or slackening of attached material, said side frame elements consisting of tubular members of metallic material, such as for instance aluminum, each of said corner elements of each pair on one end thereof comprising a beveled end surface, with said end surfaces of each said pair being disposed in generally confronting relation, means on said corner elements and on said side frame elements for detachably connecting the respective corner element to the associated side frame element, means on at least said side frame elements for rapidly securing fabric material thereto, the last mentioned means comprising a series of spaced openings in each said side frame element positioned lengthwise of the respective side frame element and adapted to receive therein pins which when passed first through associated fabric material are adapted to attach the fabric material to the frame, and rotatable actuating means coacting with each pair of said corner elements providing for selective expansion movement and contraction movement of the respective pair of corner elements relative to one another, thus providing for expansion and contraction of the frame and the stretching or slackening of material adapted to be secured thereto, said actuating means comprising a rotatable threaded shank provided with lefthand and righthand threaded portions, one of said corner elements of each of said pairs having a righthand threaded opening thereon while the other corner element of each of said pairs has a lefthand threaded opening thereon adapted for coaction with the respective of said righthand and lefthand threaded portions of said shank, thus providing for said expansion movement and retraction movement of the corner elements of each pair relative to one another upon rotation of said shank in a predetermined direction, said threaded openings extending inwardly from the respective of said beveled end surfaces generally perpendicularly thereto whereby said shank is disposed generally perpendicular to the respective beveled surface, and wherein each said shank projects through and laterally of the exterior sides of the respective pair of said corner elements, and said shank having on one end thereof a fixed handle adapted for gripping by a user's hand for manual rotation of said shank to cause said expansion and said retraction movements of the respective of said pair of corner elements, whereby said frame can be readily increased or decreased in size from exteriorly thereof.

4,519,152

TAMPER PROOF POSTER DISPLAY DEVICE

James R. Seely, Rochester, and Robert Sarkisian, Bloomfield Hills, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Aug. 8, 1983, Ser. No. 521,413
Int. Cl.³ G09F *1/12*
U.S. Cl. 40—156 **29 Claims**



1. A tamper-proof poster display device of the type having front and back portions adapted to be assembled in pivotal relationship to one another in defining a polygonal frame structure to receive a display piece, said portions being provided with coacting hinge formations in mating pivotal engagement with one another, and spring means extending between said front and back portions to bias the former with a snap-over action between a closed position in clamping engagement with the display piece and an open position to removably receive said piece, the improvement comprising said front portion having outwardly presenting first surface and laterally presenting second surface, said first and second surfaces smoothly and continuously converging to define an included dihedral angle greater than 90° and further comprising opener means removably engageable with said front portion for opening said display device.

4,519,153

DISPLAY DEVICE

Joseph C. Moon, 127 Pinewood Dr., and Arthur T. Craig, Windsor Rd., both of Greer, S.C. 29651

Filed Jun. 11, 1982, Ser. No. 387,488
Int. Cl.[3] G09F *21/04*
U.S. Cl. 40—591 2 Claims

1. A display device for use on automobiles and the like comprising a bracket having a lower main body portion, a vertically extending bore provided in said main body portion, and an attachment means carried by said main body portion for securing said bracket to an automobile;

a removable staff having a lower portion extending into said bore and an upper vertically extending portion;

said lower portion including a bifurcated portion defined by a pair of resilient sides of said lower portion with a space therebetween which bias inwardly for insertion into and through said bore;

an enlarged ridge formed in said lower portion adjacent said bifurcated portion having a cross-section larger than the remainder of said lower portion for locking said lower portion in said bore allowing interlocking of said staff and bracket for highway use and repeated removal for hand-held use of said device;

a decorative flag;

retaining members extending between said decorative flag and said upper vertically extending portion of said staff securing said flag thereto whereby said flag is permitted to wave as said automobile is driven down a highway, and said staff can be readily removed from said bracket for being carried by hand and;

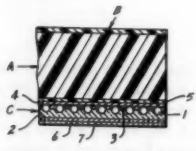
said enlarged ridge portion extending through said bore and interlocking with a bottom surface of said lower main body portion of said bracket.

4,519,154

LAMINAR STRUCTURE OF POLYCARBONATE

Richard E. Molari, Jr., Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Filed Aug. 30, 1982, Ser. No. 412,979
Int. Cl.[3] G09F *19/00*; B32B *27/36*
U.S. Cl. 40—615 13 Claims



1. An improved light reflecting sign consisting essentially of, in combination:

(i) a core structure having a rear face and a front face; and

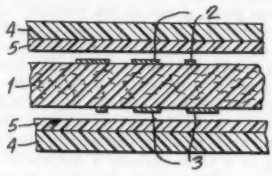
(ii) a front visible light reflecting laminate disposed on and bonded to said front face of said core structure; the improvement comprising said core structure being comprised of at least one ply comprised of a high molecular weight aromatic polycarbonate resin and having disposed on and bonded to said rear face thereof a back ultraviolet radiation protective ply.

4,519,155

IDENTIFICATION CARD

Terence J. Gallagher, Brookfield, Conn., and Anthony La-Capria, Brooklyn, N.Y., assignors to American Bank Note Company, New York, N.Y.

PCT No. PCT/US81/01110, § 371 Date Apr. 17, 1983, § 102(e) Date Apr. 17, 1983
PCT Filed Aug. 17, 1981, Ser. No. 491,950
Int. Cl.[3] G09F *3/02*
U.S. Cl. 40—625 20 Claims



1. A security document comprising:

a. a thermoplastic base sheet formed of film-fibrils bonded at its surfaces sufficiently to be receptive to printed markings thereon, said sheet having an internal structure less bonded than said surfaces;

b. security markings printed on at least one of said surfaces;

c. a layer of thermoplastic film having a melting temperature range overlapping the melting temperature range of the sheet material and having one surface fused directly to said one surface of the base sheet between the markings thereon, said layer forming with said one surface a matrix enclosing said security markings, said matrix having a delamination resistance greater than said internal structure; and

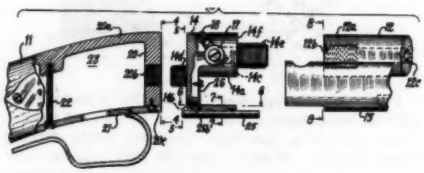
d. a protective layer bonded to the opposite surface of the layer of film.

4,519,156

FIREARM WITH INTERCHANGEABLE BARRELS

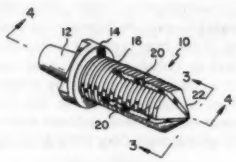
Myron J. Shaw, Church St., Lee, Mass. 01238

Filed Jun. 7, 1983, Ser. No. 501,851
Int. Cl.[3] F41C *21/22*
U.S. Cl. 42—77 14 Claims



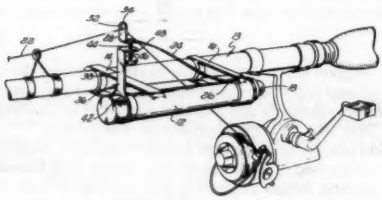
1. A muzzle-loading firearm adapted for interchangeable barrels comprising, in combination, a butt stock having a front end face, mounting means secured to said butt stock and having a front plate overlying said front end face, adapter means having a main front portion and a rear plate portion extending downwardly below said main front portion, the vertical dimension of said rear plate portion being substantially greater than the vertical dimension of the front portion, said rear plate portion being substantially co-extensive with and abutting said front plate of said mounting means, said mounting means and said adapter means having co-acting connecting means for removably securing said adapter means to said mounting means in abutting relation therewith, and barrel means secured at the front end of said adapter means and having a breech portion at its rear end abutting said adapter means at the front end thereof.

4,519,157
BLACK POWDER GUN NIPPLE
Frank Giangerelli, 14 River Edge Dr., Fairfield, N.J. 07006
Filed Oct. 17, 1983, Ser. No. 542,371
Int. Cl.³ F41C *27/00*
U.S. Cl. 42—83 12 Claims



1. A nipple for use in conjunction with firearms to permit passage of an ingnition impetus to a propellant disposed in a chamber of the firearm, the nipple comprising an elongated body, having a longitudinal chamber disposed therethrough and opening through the ends thereof, one said end of said body configured for cooperating with the ignition impetus, a portion of said body adjacent to the other said end thereof for disposition in a propellant, said portion of said body having disposed therein at least one vent means opening through a wall thereof and said longitudinal chamber.

4,519,158
FISHING LINE ACTIVATOR INDICATOR
Johnie C. Kirk, Garden Grove, Calif., assignor to Carl R. Rodriguez, Hemet, Calif., a part interest
Filed Oct. 11, 1983, Ser. No. 540,564
Int. Cl.³ A01K *97/12*
U.S. Cl. 43—17 1 Claim



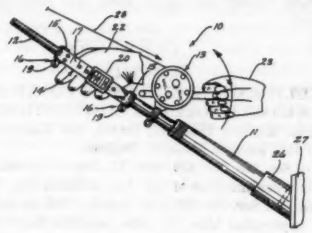
1. Apparatus for indicating activation of a fishing line comprising:

a support body having a signal light indicator means mounted therein and having means for securing said body to a fishing pole having a fishing line associated therewith;

switching means for activating said light indicator when a force is applied to said fishing line, said switching means including an L-shaped base having a vertical arm and a horizontal arm, one end of said vertical arm being secured adjacent to said support body, the other end of said vertical arm being secured to one end of said horizontal arm; a screw contact number being secured to the other end of said horizontal arm and being adjustable along an axis perpendicular to the plane of said horizontal arm; and

a curved spring arm having one end secured adjacent to the other end of support body and its free end terminating in an upwardly-extending axis generally parallel to said L-shaped base vertical arm, said spring arm free end having an opening therein for positioning said fishing line therein once said fishing line has been cast, said adjustable contact member being adjustable to vary the distance between said contact member and said curved spring arm.

4,519,159
STABILIZER STRAP
Sebastian Fazio, 188 Raymond Rd., Rocky Hill, Conn. 06067
Filed Jan. 9, 1984, Ser. No. 569,406
Int. Cl.³ A01K *97/00*
U.S. Cl. 43—25 4 Claims

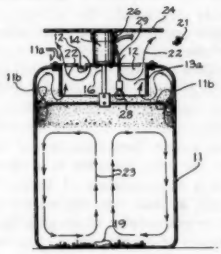


1. An accessory for use with fishing poles of a type including a stiff handle section at one end thereof and a flexible section at the other end thereof, said flexible section having fishing line guide means thereon and said handle section having means intermediate the ends thereof for attachment of a fishing reel thereto, said accessory comprising:

stablizer means for preventing undesirable rotation of said fishing pole while a fish is being reeled in, said stablizer means comprising a flexible strap; and

means for connecting each end of said strap to said handle section forwardly of said fishing reel for generally positioning said strap to one side of said handle section whereby one hand can be received between said strap and said handle section thereby preventing undesirable rotation of said fishing pole.

4,519,160
MEANS FOR KILLING FLYING INSECTS AND FOR DISCHARGING AN ATTRACTANT THEREFROM
Carl L. McBrayer, 428 Grand St., Redwood City, Calif. 94062
Continuation of Ser. No. 348,846, Feb. 16, 1982,. This application Jun. 8, 1984, Ser. No. 618,755
Int. Cl.³ A01M *1/04, 5/02*
U.S. Cl. 43—113 1 Claim



1. A machine for killing flying insects and propagating a sex attractant therefrom comprising container means forming an enclosure having an opening leading into said enclosure, motive means carried by said container means externally of said enclosure and disposed substantially axially of said opening, an elongate stiff wire-like element extending substantially fully across said opening and coupled to said motive means to be rotated within said enclosure substantially in a plane lying across said opening and at a rate sufficient to substantially preclude any such insect from flying across said plane, said element serving to deflect any such insect to cause it to strike

the inner sidewall of said enclosure with sufficient impact to develop a sex attractant therefrom, said opening being surrounded by an edge margin, means forming a skirt depending downwardly from said edge margin of said opening, said skirt extending sufficiently downwardly so as to intercept parts of insects which ricochet from said sidewall toward said motive means to prevent the parts from reaching the motive means, said element further serving to pump said attractant into the atmosphere.

4,519,161

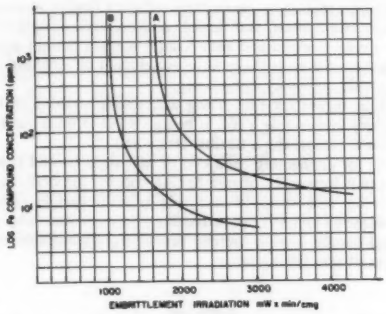
AGRICULTURAL PROCESS USING CONTROLLABLY DEGRADABLE POLYMER COMPOSITION FILM

Dan Gilead, Kibbutz Hazorea, Israel, and Gerald Scott, 338 Station Rd., Knonte, Solihull, England

Division of Ser. No. 503,629, Jun. 13, 1983, Pat. No. 4,461,853, which is a continuation of Ser. No. 304,663, Sep. 22, 1981, abandoned, and Ser. No. 940,726, Sep. 8, 1978, abandoned. This application Mar. 26, 1984, Ser. No. 593,528

Int. Cl.³ A01G *1/00*; C08K *5/47*

U.S. Cl. 47—9 **9 Claims**



1. Agricultural process which comprises laying out a protective or mulching film in a crop-blowing soil area, which film is capable of controllable degradation to embrittlement, allowing it to lay in the area at least until it has reached its embrittlement stage and subsequently carrying out soil working operations in said area thereby substantially to eliminate the film from the soil surface,

wherein said film comprises a plastic composition which is controllably degradable by photooxidation and which composition comprises a vinyl polymer, at least one first complex comprising a non-ionic organosoluble antioxidant complex of iron with a chain-breaking, peroxide-decomposing, metal ion deactivating or ultraviolet light stabilizing compound selected from the group consisting of a dithiocarbamate, dithiophosphate, xanthate, cyclic phosphate, oxime, benzthiozole and benzimidazole, and such that the iron complex is a photoactivator and is present in a concentration of about 0.0005 to 0.5% by weight, and at least one second complex comprising a non-ionic organosoluble ultraviolet light stabilizing complex of nickel or cobalt with a chain-breaking, peroxide-decomposing, metal ion deactivating or ultraviolet light stabilizing compound selected from the group consisting of a dithiocarbamate, dithiophosphate, xanthate, cyclic phosphate, oxime, benzthiazole and benzimidazole, and such that the nickel or cobalt complex is a photostabilizer and is present in a concentration of about 0.01 to 0.5% by weight, the concentrations of the iron complex and nickel or cobalt complex being independently varied relative to each other yet coordinated to produce a controllably desired ultraviolet photodegradation embrittlement time for the composition, which embrittlement time is capable of being retarded or delayed by controlling the length of the induction period defining the interval between the start of exposure to photodegrading ultraviolet light and the point at which ultraviolet photodegradation by photooxidation begins in dependence upon the controllable amount of the nickel or cobalt complex in relation to the amount of the iron complex, and which composition upon reaching the end of the induction period and the point at which ultraviolet photodegradation by photooxidation begins is capable of undergoing photodegration at a correspondingly comparative rapid photooxidation rate to ultimate embrittlement in dependence upon the controllable amount of the iron complex in relation to the amount of the nickel or cobalt complex, said composition being such that at a concentration ratio by weight of about 1:1 or the nickel or cobalt complex to the iron complex the embrittlement time thereof is at least about 125 hours after exposure to photodegrading ultraviolet light.

4,519,162

VERTICAL PLANT SUPPORT WITH HORIZONTAL HOOPS

William C. Stuckey, 1503 Virginia St. E., Charleston, W. Va. 25311

Filed Aug. 2, 1983, Ser. No. 519,658

Int. Cl.³ A01G *9/12*

U.S. Cl. 47—47 **4 Claims**

1. A plant support of the type having a post for driving into the ground and at least one cantilevered plant support wire rod members releasably and lockably supported in cantilever fashion from said post, the improvement comprising,

said post being of the type having a U-shaped center portion comprised of a base and a pair of legs with laterally projecting flanges projecting from the legs of said U, and a plurality of hole-slot pairs in said base of said U-shaped center portion and along the length thereof,

each said plant wire rod member having integrally formed on the ends thereof a brace member for engaging said pair of flanges on said post, and

a clip of resilient material having shape memory, said clip having a central portion and a pair of prong members, one prong member attached to each end of said central portion, said clip releasably and lockably engaging said brace member against said laterally spaced projecting flange members, and said central portion including a pair of hooks, one hook on each said prongs, for engaging the base portion of said post member through said hold-slot pairs.

4,519,163

CONTROLLED GROWTH OF MUNG BEAN SPROUTS

James F. Bonner, South Pasadena, Calif., assignor to Phytogen, Pasadena, Calif.

Continuation-in-part of Ser. No. 421,128, Sep. 22, 1982, abandoned. This application Sep. 9, 1983, Ser. No. 530,854

Int. Cl.³ A01B *79/00*

U.S. Cl. 47—58 **18 Claims**

1. A process for growing of mung bean sprouts of increased

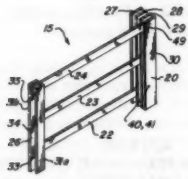
diameter which comprises exposing sprouted mung beans in the absence of light to a spray of aqueous plant-growth hormone solution comprising a plant-growth hormone selected from the group consisting of an auxin, a biological analogue thereof, and mixtures thereof, and present in a concentration of from about 0.1 to about 5 ppm by weight to volume of said aqueous solution and to a plant-growth regulator atmosphere comprising oxygen and from about 0.5 to about 3 ppm by volume of a plant-growth regulator selected from the group consisting of ethylene, acetylene and mixtures thereof for at least a portion of a selected period of mung bean sprout growth.

4,519,164

GATE WITH MULTIPLE PIVOT AXES FOR RAIL MEMBERS

Richard A. Porter, P.O. Box 11, Kittridge, Colo. 80457

Filed Jan. 9, 1984, Ser. No. 569,484
Int. Cl.³ E05C *7/06*
U.S. Cl. 49—108 **7 Claims**



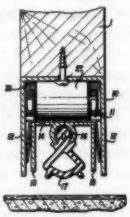
1. A gate mechanism, comprising in combination, support post means and a plurality of rails, each of said rails being pivotally connected to said support post means for movement in parallel planes between a horizontal closed position and a vertical open position, drive means for driving each of said rails in concurrent pivotal movement, said drive means being operably connected to each of said rails near said pivotal connection.

4,519,165

SEALING DEVICE FOR THE BOTTOM OF A DOOR

Dieter-Julius Cronenberg, and Jenö Faflek, both of Arnsberg, Fed. Rep. of Germany, assignors to F. Athmer, Arnsberg, Fed. Rep. of Germany

Filed Jan. 5, 1984, Ser. No. 568,452
Int. Cl.³ E06B *7/20*
U.S. Cl. 49—307 **3 Claims**



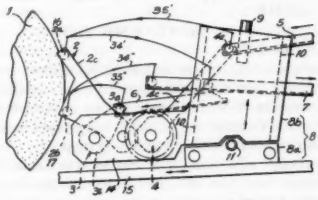
1. A sealing device for the bottom of a door comprising
(a) a first inverted U-shaped sectional bar for mounting along the bottom of a door, said first sectional bar including a horizontal web and a pair of spaced legs depending therefrom and terminating in free longitudinal edges;
(b) a horizontal partition wall connecting the legs with one another at a position intermediate and spaced from the horizontal web of the first sectional bar and the free ends of the legs thereof to provide an upper rectangular chamber and a lower rectangular chamber, the latter being open at its bottom side;
(c) a second inverted U-shaped sectional bar including a horizontal web at its upper end portion and a pair of spaced legs depending therefrom and terminating in free longitudinal edges to provide a third rectangular chamber open at its bottom side, said second sectional bar being disposed in said lower chamber of said first sectional bar and vertically movable in said lower rectangular chamber, said second sectional bar being of smaller size than said first sectional bar such that a gap is provided between the confronting respective interior and exterior surfaces of said legs of said first and second sectional bars and the confronting respective lower surface of said horizontal partition wall and the upper surface of said web portion of said first and second sectional bars;
(d) a first elastic sealing means in the form of a sealing strip of profile material mounted in said third chamber of said second sectional bar;
(e) second elastic sealing means of plastic material and comprising at least one elongated sealing strip disposed in said gap, a longitudinal portion of said sealing strip, intermediate longitudinal edge portions on opposite sides thereof, extending between said respective lower surface of said horizontal partition wall of said first sectional bar and said upper surface of said web portion of said second sectional bar and being secured to said upper surface of said web portion of said second sectional bar and said longitudinal edge portions of said sealing strip on opposite sides of said central portion thereof extending downwardly between said respective adjacent interior surfaces of said legs of said first sectional bar and said exterior surfaces of said legs of said second sectional bar, said longitudinal edge portions of said sealing strip continuously contacting, due to the inherent elasticity of said sealing strip, the respective inner surfaces of said legs of said second sectional bar, thereby to prevent the passing of draft or smoke in either direction through said gap between said respective legs of said first and second sectional bars and said respective partition wall and web portion of said first and second sectional bars; and
(f) means in said upper chamber of said first sectional bar for raising and lowering said sealing strip together with said second sectional bar upon opening and closing the door.

4,519,166

WORKPIECE HANDLING APPARATUS FOR GRINDING MACHINES

Harald Petermann, Nuremberg, and Karl G. Loesch, Spardorf, both of Fed. Rep. of Germany, assignors to Georg Muller Kugellagen Fabrik K.G., Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,039
Int. Cl.³ B24B *5/22*
U.S. Cl. 51—103 WH **12 Claims**



1. Workpiece handling apparatus for use in a grinding machine including a rotatable grinding wheel, comprising:
means for supporting a pair of workpieces at a respective pair of spaced load positions staggered on the periphery of the grinding wheel;

means for moving said workpiece supporting means and grinding wheel toward each other in a longitudinal direction in order to feed the pair of workpieces supported on said supporting means against the grinding wheel in a grinding operation;

means for holding unground workpieces so that each of a pair of unground workpieces is situated at a respective pickup position of a pair of pickup positions;

discharge means for receiving finished or ground workpieces;

loading means for simultaneously transporting each of the pair of unground workpieces from said respective pickup position at said holding means to said respective one of said pair of load positions and at the same time simultaneously unloading each of a pair of finished or ground workpieces from said respective load position and transporting the same to said discharge means, said loading means including three carrier arms, said three carrier arms comprising one unloading arm and two loading arms, said unloading arm including means for carrying both of the pair of finished workpieces to unload and transport the same from said respective load positions to said discharge means, said two loading arms each including means for carrying the respective one of the pair of unground workpieces from said respective pickup position at said holding means to said respective one of said pair of load positions;

means associated with said unloading arm for effecting engagement thereof with both of the pair of finished workpieces at said respective load positions and for effecting disengagement thereof at said discharge means;

means associated with each of said two loading arms for effecting engagement thereof with the respective one of the pair of unground workpieces at said respective one of said pair of pickup positions and for effecting disengagement thereof at said respective one of said pair of load positions; and including

means for lifting the pair of ground workpieces from said respective load positions at least slightly away from the grinding wheel over respective substantially rectilinear paths to unload the finished workpieces from said respective load positions prior to transporting the finished workpieces to said discharge means; and

means for moving said carrier arms in unison, each of said carrier arms being pivotally mounted on said carrier moving means.

4,519,167

PROCESS AND APPARATUS FOR THE AUTOMATIC CONTROL OF MOVEMENT OF AN EDGE GRINDING MACHINE

Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinmold, Aachen; Alfred Schmitz, Aachen, and Heinz Mund, Aachen, all of Fed. Rep. of Germany, assignors to Saint-Gobain Vitrage, France

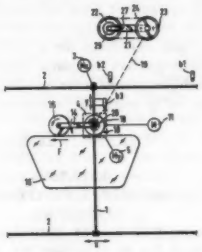
Filed Jan. 19, 1983, Ser. No. 459,116

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1982, 3201494

Int. Cl.³ B24B *9/10*

U.S. Cl. 51—165.77 **26 Claims**

2. An apparatus for the automatic all-around path control of a processing tool mounted on a cross sled adapted for movement within an X-Y coordinate system comprising an X- drive motor and a Y- drive motor for driving said cross sled, a scanning instrument including a scanning organ for scanning a path along an edge of a glass pane and an arm mounting said scanning organ, said arm mounted to said cross sled for rotation about the axis of said processing tool, said arm locating said scanning organ in advance of said processing tool and maintaining said scanning organ and processing tool at a spaced distance equal to the length of said arm, means for maintaining said scanning organ in position against said glass pane, means responsive to the spatial position of said scanning organ within the X-Y coordinate system and the angular position of said arm in relation to one of said axes, said means generating continuously a signal representative of said positions for said path control, a storage having a double axis storage and a capability of storing said signal for path control over a distance of move-



ment always equal to the length of said arm, said signal being connected to said storage and passed to an output, and circuit control means connected at said storage output for regulating the speed ratio of said X-Y drive motors.

4,519,168

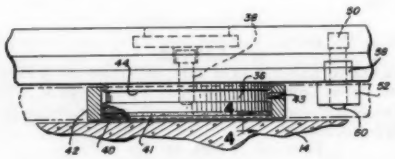
LIQUID WAXLESS FIXTURING OF MICROSIZE WAFERS

Joseph V. Cesna, Niles, Ill., assignor to Speedfam Corporation, Des Plaines, Ill.

Continuation of Ser. No. 290,615, Aug. 6, 1981, abandoned, which is a continuation of Ser. No. 76,670, Sep. 18, 1979, abandoned. This applic tion Dec. 5, 1983, Ser. No. 557,904

Int. Cl.³ B24B *37/04*

U.S. Cl. 51—216 LP **5 Claims**



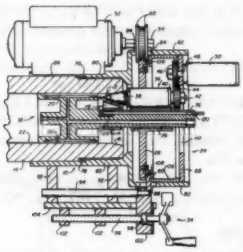
1. A fixture for use with a lapping machine to hold a plurality of thin generally flat wafers against a lapping wheel during a lapping operation, said fixture comprising, in combination, a baseplate, a plurality of round pedestal disc members of a diameter corresponding approximately to said wafers and secured to said baseplate in spaced relation to each other, a plurality of round pads of firm but resilient foam-like cellular material having internal open cells, one pad being secured to each pedestal surface to substantially cover the same, each pad having an exposed surface machined to match said lapping wheel surface to effect parallelism therewith, and a plurality of rings with one ring removably secured to each of said pedestals to closely surround and project beyond the surface of a corresponding one of said pads, said rings serving to assist in mounting each wafer centrally on a corresponding pad, and said rings also serving to cooperate with a corresponding pad so when said pad is wetted with a hygroscopic liquid and a wafer is pressed against the pad, said ring in combination with the hygroscopic liquid will aid in maintaining a seal to prevent abrasive slurry used in the lapping operation from entering the pad and damaging the side of the wafer opposite the side being lapped.

4,519,169

PORTABLE ORBITING GRINDING MACHINE

Thomas V. Smith, Troy, N.Y., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 14, 1983, Ser. No. 550,856
Int. Cl.³ B24B 19/26
U.S. Cl. 51—241 S 5 Claims



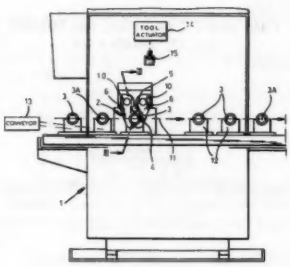
1. A portable orbiting grinding machine for grinding the gas check seat on a gun tube, said machine comprising:
an expandable arbor adapted to fit within said gun tube,
an orbital spur gear assembly mounted on said arbor extension and adapted to revolve thereon,
said spur gear assembly including a grinding wheel having a shape desired for said gas check seat, and
a feed mechanism assembly for providing logitudinal travel of said spur gear assembly on said arbor extension to engage and disengage said grinding wheel with said gas check seat, and
means for revolving said grinding wheel and said orbital spur gear assembly.

4,519,170

METHOD OF AND APPARATUS FOR HOLDING A SHAFT DURING FINISH GRINDING

Ernst Thielenhaus, Wuppertal, Fed. Rep. of Germany, assignor to Ernst Thielenhaus KG, Wuppertal, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,509
Claims priority, application Fed. Rep. of Germany, Oct. 30, 1982, 3240332
Int. Cl.³ B24B 1/00
U.S. Cl. 51—289 R 11 Claims



1. A method of machining a workpiece having a generally cylindrical outer surface centered on an axis, the method comprising the steps of:
closing a pair of journal halves having generally semicylindrical inner surfaces of slightly greater diameter than the outer workpiece surface around the workpiece;
pumping a fluid under superatmospheric pressure into the space between the journal inner surface and the workpiece outer surface and thereby supporting the workpiece in the journal halves on the liquid generally out of contact with the inner surfaces thereof;
rotating the thus supported workpiece about its axis; and
engaging a finishing tool radially against the workpiece.

4,519,171

WORK-HOLDING FIXTURE FOR CRYOGENIC DECOATING

David J. Klee, Emmaus, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jan. 26, 1983, Ser. No. 461,087
Int. Cl.³ B24C 9/00
U.S. Cl. 51—419 9 Claims

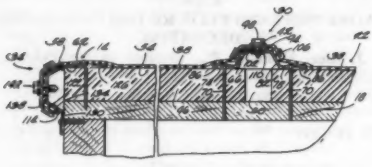
1. An apparatus for blasting of workpieces with impact media within a thermally insulated chamber having an outwardly opening access door,
a cantilever beam affixed adjacent the upper edge of said door and arranged to extend into the interior of said chamber when the door is in a closed position,
drive means affixed to the free end of said beam having a downwardly extending rotatable power take-off shaft,
a work-supporting fixture suspended from said power take-off shaft by a quick coupling device, wherein said device comprises bevelled mating surfaces providing a friction drive between said power take-off shaft and said work-supporting fixture whereby the assembly of mating surfaces is self-centering and wherein said quick-coupling device also comprises a first coupling component affixed to said power take-off shaft and a mating C-shaped connector component, attached to said work-supporting fixture, in the form of a short hollow tube having an inner diameter substantially exceeding the outer diameter of said power take-off shaft, said connector component providing a slot at a side thereof affording lateral access for passage therethrough of said first coupling component for engagement and seating of said mating surfaces and an upper laterally extending arm and a lower laterally extending arm vertically spaced from one another at a distance substantially greater than the length of said first coupling component, the inner peripheral surface of said upper arm being bevelled to form a downwardly divergent frusto-conical rim for mating engagement with the first coupling component in nested position, the distance between the upper and lower arms being amply sufficient to afford an easy quick passage for insertion of said first coupling component therebetween when said connector component is in raised position above the lower arm of said connector component, and the opposed outer edges of the laterally extending arms of said connector component are bevelled to accommodate possible horizontal misalignment, whereby rotation of said power take-off shaft is transmitted to effect rotation of said fixture and the weight of the fixture exerts a downward force on the corresponding mating surface effecting sufficient friction at the surfaces of contact to establish a reliable friction drive for rotation of said C-shaped connector component.

4,519,172

WATERPROOF ROOF

Delano H. Ristow, 10015 Steinthal Rd., Kiel, Wis. 53042

Filed Apr. 1, 1983, Ser. No. 481,245
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—96 **18 Claims**



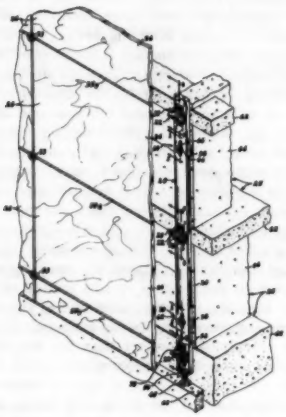
1. A waterproof roof including a supporting roof structure, an assembly including a first elongated member supported by said supporting roof structure and including a raised portion, and a second elongated member with a shape generally conforming to said raised portion, a generally continuous elastic sheathing member covering said supporting roof structure and sandwiched between said first and said second elongated members of said assembly, and means for attaching said second member to said raised portion, said attaching means comprising a fastener which extends through said sheathing member and between said second member and said raised portion and which is not connected to said supporting roof structure.

4,519,173

SLAB-HANGING SYSTEM

Lewis L. Roberts, Indianapolis, Ind., assignor to Mercury Development Corp., Indianapolis, Ind.

Filed Jun. 7, 1982, Ser. No. 385,861
Int. Cl.³ E04H *1/04*
U.S. Cl. 52—235 **1 Claim**



1. Slab-hanging means for removably supporting a vertically-arranged series of slabs upon associated supporting structure, the slab-hanging means comprising, in combination:

a vertical support column member;

retaining means for retaining the support column member to the associated support structure, the retaining means providing adjustments both horizontally and vertically and outwardly, with respect to the associated supporting structure;

the support column member being provided with a series of spaced connector means for co-operating with interconnecting means as mentioned below;

a shelf slab-hanger for each of the series of spaced connector means;

interconnecting means for interconnecting each of the slab-hangers to the support column member by co-operation with respective ones of said connector means;

the said slab-hangers each providing a support shelf or abutment upon which may rest one of said slabs, and the full adjustability of the support column member achieving the proper alignment and positioning of all of the said slab-hangers mounted thereon, and thus assuring that all slabs supported in the series will be properly aligned and positioned when seated upon the respective slab hanger.

4,519,174

STAIN-RESISTANT EARTHEN ARTICLES, GROUT AND FLOOR AND WALL SURFACES COMPOSED THEREOF

Alvin E. Witt, Media, Pa., assignor to PermaGrain Products, Inc., Media, Pa.

Division of Ser. No. 292,018, Aug. 11, 1981, Pat. No. 4,407,884.
This application Sep. 30, 1982, Ser. No. 431,610
Int. Cl.³ E04F *13/18*
U.S. Cl. 52—389 **24 Claims**

1. A stain- and wear-resistant wall or floor surface comprising:

a plurality of composite earthen-plastic articles having improved stain-resistance and strength;

said articles comprising a porous earthen body having a synthetic plastic polymerized in situ therein and being further impregnated with a penetrating solution comprising a drying oil or a semi-drying oil;

said polymerized synthetic plastic being substantially uniformly distributed throughout said earthen body;

said drying oil or semi-drying oil also being substantially uniformly distributed throughout said earthen body;

whereby said articles have a substantially uniform composition throughout the thickness thereof with the pores substantially filled with said plastic and oil to provide said stain-resistance;

said articles being assembled in said wall or floor surface imbedded in a layer of stain-resistant grout surrounding the edges of said articles and holding them in position in said surface;

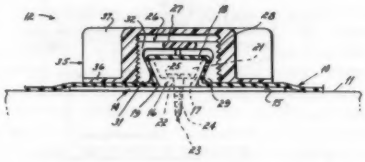
whereby a wall or floor surface is provided having improved breaking strength and stain-resistance.

4,519,175

LUBRICATED ROOFING MEMBRANE FASTENER

Stevan A. Resan, Carlisle, Pa., assignor to Carlisle Corporation, Cincinnati, Ohio

Filed Jun. 15, 1983, Ser. No. 504,462
Int. Cl.³ E04D *5/14*
U.S. Cl. 52—713 **15 Claims**



1. A fastener for holding a roofing membrane to a roof without puncturing the roofing membrane comprising:

an anchoring disc, said disc including a central hollow inverted, frusto-conical button;

an externally threaded tined retainer cap adapted to snap onto said button of said anchor with said membrane held between said retainer and said button to clamp said membrane to said button;

a permanent lubricant applied to the internal surface of said

tined retainer cap which does not evaporate under atmospheric conditions; and

an internally threaded cover adapted to screw onto said externally threaded retainer cap to hold said tined retainer cap and button engaged with said membrane gripped therebetween.

4,519,176

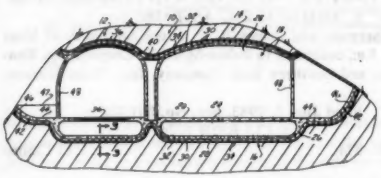
MODULAR METHOD OF MAKING A BUILDING STRUCTURE

Richard D. Britz, Eugene, Oreg., assignor to Earthship Enterprise, Inc., Mt. Pleasant, Mich.

Filed Jun. 28, 1982, Ser. No. 392,643

Int. Cl.³ E04B *1/62*

U.S. Cl. 52—742 **3 Claims**



1. A method for constructing a modular building structure comprising the steps of:

(A) forming a cavity in the ground having a planar bottom and upstanding side walls having an outwardly facing convex shape;

(B) applying a layer of a waterproof material over the interior surface of the cavity;

(C) applying a layer of an insulating material over the layer of waterproof material;

(D) applying a layer of concrete over the layer of insulating material to form a base with a hollow recess;

(E) filling the recess with inflatable means and a top layer of earth up to the top edges of the side walls of the base;

(F) applying a layer of concrete over the top of the base to form an upper planar portion for the base;

(G) removing the inflatable means and earth from the interior of the base to define a hollow interior space between the upper and lower portions and the side walls of the base;

(H) mounting in registry a plurality of frame panels on the base to form an upper shell frame;

(I) applying concrete about the exterior of the upper shell frame;

(J) applying a layer of an insulating material over the concrete layer;

(K) applying a layer of a waterproof material over the layer of insulating material; and

(L) removing the shell frame from the interior of the concrete layer to form a hollow upper shell.

4,519,177

METHOD FOR REINFORCING TUBULAR DUCTS

Derek V. Russell, Timperley Nr Altrincham, England, assignor to Alphacrete Construction Linings (UK) Limited, Cheshire, England

Filed Dec. 8, 1982, Ser. No. 447,979

Claims priority, application United Kingdom, Dec. 14, 1981, 8137653

Int. Cl.³ E04B *1/16*

U.S. Cl. 52—745 **10 Claims**

1. A method for reinforcing the walls of tubular ducts such as serers comprising introducing into the duct elongate board-like longitudinally flexible reinforcement members each comprising at least one layer of a first material having large interstices and at least one layer of a second material having relatively small interstices and arraying said members circumferentially inside the duct to form a tubular reinforcement covering the walls of the duct, securing said member against the wall of

the duct and applying concrete to said covered walls whereby to provide a reinforced concrete lining to said duct.

4,519,178

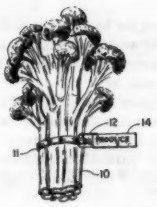
METHOD AND APPARATUS FOR PLACING TAGS ON PRODUCE AND THE LIKE

Richard V. Crabb, Jr., Aromas, Calif., assignor to Salinas Valley Engineering & Manufacturing, Inc., Salinas, Calif.

Filed Jul. 14, 1983, Ser. No. 513,608

Int. Cl.³ B65B *27/10, 61/26*

U.S. Cl. 53—137 **4 Claims**



1. Apparatus for bunching and marking articles with a closure having an opening in one of its sides for receiving a ribbon object, said apparatus comprising:

a plurality of holding means each movable between first and second positions for receiving and holding an endless elastic band when in the first position and for stretching the elastic band to form a larger opening therethrough for placement of articles into said band opening and for reducing the cross section of the band when in the second position;

means for holding a closure in position for the opening therein to intersect the elastic band as the arms are moved from the first to the second position to cause the band to enter the opening;

moving means to move said holding means from the first to the second position to stretch the band and cause relative movement between said band and closure to cause said band to enter said closure openings; and

means to move the arms from the second to the first position with the elastic band attached to allow the elastic band to relax and increase in cross sectional area to pull and separate the closure from the holding means.

4,519,179

APPARATUS FOR ALIGNING AND BOXING FLAT ANGULAR ITEMS

Siegfried Meier, Neuhausen am Rheinfall, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Oct. 6, 1982, Ser. No. 433,032

Claims priority, application Switzerland, Nov. 6, 1981, 7124/81

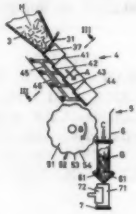
Int. Cl.³ B65B *19/34*

U.S. Cl. 53—236 **10 Claims**

1. In an apparatus for filling packaging boxes with flat, angular articles, including an intermediate container accom-

modating the articles in a random pile; a charging hopper introducing the articles into the packaging boxes; and conveying means delivering the articles from said intermediate container into said charging hopper; the improvement in said conveying means comprising

(a) a first aligner including a plurality of serially arranged single troughs each having side walls and a bottom wall defining a channel; the channels formed in said troughs being serially connected to form a sole continuous conveying track having an outlet end; said channels including



aligning means for turning the articles, advancing thereon in a flow, into an at least approximately parallel orientation by the time they arrive to said outlet end of said conveying track; and

(b) a second aligner including a rotary transfer wheel situated between said outlet end of said conveying track and said discharge hopper for conveying articles in an at least approximately parallel orientation to one another from said outlet end of said conveying track to said charging hopper.

4,519,180

WRAPPING MACHINE

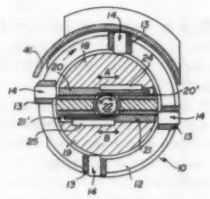
Jean Maure, Renens, Switzerland, assignor to Societe Anonyme des Plieuses Automatiques, Switzerland

Filed Apr. 23, 1982, Ser. No. 371,237

Claims priority, application Switzerland, Jun. 23, 1981, 4132/81

Int. Cl.³ B65B *11/28*

U.S. Cl. 53—234 **4 Claims**



1. A wrapping machine, for products to be grouped inside a common package, comprising a machine support, a device for feeding wrapping material, means for transporting groups of products, receptor means disposed to simultaneously receive at least one section of wrapping material of a predetermined length, ejector means to eject the product at least partially wrapped in said material, and a drive means, for the cylinder, with a hollow shaft, said hollow shaft containing a tubular piece affixed to the machine's support and connected to the stationary cylindrical block disposed inside the cylinder, wherein:

the receptor means and the transporting means consist of a hollow rotatable cylinder, the periphery of which is provided with openings each extending through to the interior of the cylinder for receiving and transporting a group of products and a corresponding section of wrapping material, a stationary cylindrical block disposed in the interior of the rotation cylinder to provide a guide surface defining a radially inward base for each said opening to guide said products and wrapping material;

the ejector means consists of at least one grooved slide mounted on said stationary cylindrical block;

the stationary cylindrical block has at least one opening disposed to house a said grooved slide which can be laterally displaced; and

the grooved slide is equipped with a bar which engages a toothed pinion connected to a rotatable shaft within said hollow shaft, said rotatable shaft being connected to a cam-driven mechanism for periodically laterally displacing the grooved slide.

4,519,181

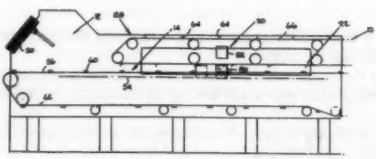
SLEEVE CARTON END PANEL AND FLAP FOLDING AND SEALING ASSEMBLY

Earle C. Sherman, and James B. P. Green, Jr., both of West Monroe, La., assignors to Johns-Manville Corporation, Denver, Colo. and Southern Tool Company, Inc., West Monroe, La.

Filed Jun. 7, 1983, Ser. No. 501,953

Int. Cl.³ B31B *1/26*

U.S. Cl. 53—374 **12 Claims**



1. In a sleeve carton machine for packaging a plurality of articles within a sleeve carton comprising a top panel, a bottom panel, a pair of side panels, a dust flap hingedly joined to each end of each side panel, an upper end panel hingedly joined to each end of said top panel, and a lower end panel hingedly joined to each end of said bottom panel, said machine including a sleeve carton conveyor means for conveying said sleeve cartons through said machine, means for folding said dust flaps on each end of said sleeve cartons inward toward each other after said sleeve cartons have been loaded with articles, means for applying adhesive to outer surfaces of said dust flaps after said dust flaps have been folded inward, and folding means for folding said upper and lower end panels against said dust flaps and pressing said end panels against said dust flaps while said adhesive sets to seal said carton, said folding means comprising a pair of lower end panel folding plates mounted directly opposite each other on either side of and adjacent said sleeve carton conveyor, means for moving said lower folding plates in unison in an upward and downstream direction to fold said lower end panels up against said dust flaps, a pair of upper end panel folding plates mounted above said lower folding plates and directly oposite each other on either side of and adjacent said sleeve carton conveyor, and means for moving said upper folding plates in unison in a downward and downstream direction to fold said upper end panels down against said dust flaps.

4,519,182

ARTICLE WRAPPER AND METHOD OF FORMING

John K. Lever, Redwood City, and Angelo N. DiVecchio, Los Altos, both of Calif., assignors to Certipak Corporation, Greenwich, Conn.

Filed Dec. 17, 1982, Ser. No. 450,522

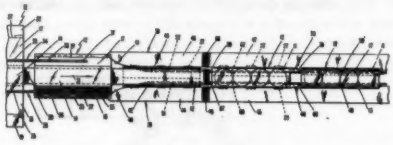
Int. Cl.³ B65D *5/04;* **B65B** *11/00*

U.S. Cl. 53—461 **8 Claims**

1. An article wrapper for wrapping around an article or articles comprising an elongated blank having a top portion, side panels, fold means between said side panels and said top

portion to connect them to each other, a pair of bottom panels, a pair of score lines between each of said bottom panels and the side panel to which said bottom panel is connected, a plurality of tabs formed between each pair of said score lines, and each of said tabs having its base connected to said score line farthest from said side panel to which said bottom panel is connected so that said tabs are not viewable when said blank is wrapped around the article.

4. A method of forming an article wrapper from an elongated blank in which the article wrapper is wrapped around an article or articles including forming the blank with a top portion, side panels connected to the opposite sides of the top



portion, fold means between each of the side panels and the top portion, a bottom panel connected to each of the side panels, and a pair of score lines between each of the side panels and the connected bottom panel, compression tabs for tightening the wrapper defined between said fold lines, positioning the blank substantially horizontal above the article to be wrapped, bending the side panels about the fold means, and bending and moving the bottom panels relative to the side panels about the two score lines to dispose each of the side panels with an angled corner with the connected bottom panel and the edge of the corner being defined by the score line closest to the side panel so as to maintain the side panels uninterrupted and the tabs hidden on the bottom of the wrapper.

4,519,183

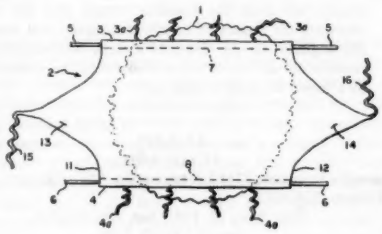
METHOD AND MEANS OF BAGGING LOOSE TRASH

Ross Parody, 1 Story Acres, Essex, Mass. 01929

Filed Aug. 5, 1983, Ser. No. 520,562

Int. Cl.³ B65B *11/00*

U.S. Cl. 53—461 **5 Claims**



1. A method of bagging loose material on a surface comprising the steps of:

(a) providing a flexible sheet having length and width to cover the material, of which two parralel long sides are rigid,

(b) laying the sheet over the material,

(c) moving the rigid long sides together between the surface and the material so that they are parallel and adjacent to each other and the sheet defines a cylindrical envelope enclosing the material,

(d) turning the envelope over,

(e) fastening the long sides together and

(f) securing the ends of the envelope so that the material is contained within the envelope.

4,519,184

LIQUID FILLING APPARATUS

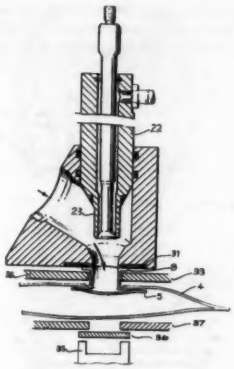
Robert Brunswick, Clayton, Australia, assignor to Wrightcel Limited, Victoria, Australia

Filed Jan. 11, 1982, Ser. No. 338,483

Claims priority, application Australia, Jan. 13, 1981, PE7222; Jan. 16, 1981, PE7227

Int. Cl.³ B65B *31/06, 1/48*

U.S. Cl. 53—503 **6 Claims**



1. Apparatus for filling flexible containers with a liquid, said flexible containers having collar means affixed to one wall of said flexible container, said collar having an opening for filling said container and a flap means for closing said opening, comprising:

a fixed filling head, with a peripheral seal means located at the bottom of said filling head;

holding means for gripping said collar of said flexible container and positioning said collar against said peripheral seal means to provide a seal;

support means below said filling head on which said flexible containter is borne, said support means including a port in said support surface having means to both support the flexible container during the filling operation and to provide access for a heat sealing member to be brought into contact with said flexible container, and a heat sealing member being located below said support member to seal fluid tight by heat, the flap over the opening in said collar means.

4,519,185

DEVICE FOR DEFLECTION OF A CONTINUOUS FILM WEB IN A PACKAGING MACHINE

Roland Horn, Frickenhausen, and Erhardt Glausch, Nürtingen-Neckarhausen, both of Fed. Rep. of Germany, assignors to Beck & Co., Packautomaten, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,648

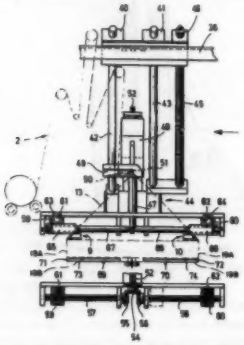
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1981, 3125353; Dec. 31, 1981, 3152023

Int. Cl.³ B65B *9/06*

U.S. Cl. 53—550 **27 Claims**

1. In a packaging machine for wrapping objects sequentially fed into the machine with film from a continuous film web folded into two halves flat against each other about an axial midline and in which the two folded film web halves are fed in a vertical plane located parallel to the feed direction of objects into the machine, a device for deflecting the two folded film web halves so as to cause the web to open along its axial edges comprising means for causing separation of the two folded film web halves in a roof-like manner along a ridge edge line extending parallel to the feed direction of the objects such that the two film web halves are formed into respective roof side

zones extending from the respective axial edges of the web parallel to the feed directions of the objects to a triangular roof end zone opposite where the two film web halves axial edges have been opened and the triangular zone has an apex at the ridge edge line and a base which is transverse to the object feed direction and spaced from the apex of the triangular zone toward the open axial edges of the web and for forming the web into a top covering zone for the objects which extends horizontally from the base of the triangular zone and into further covering zones which extend vertically downwardly from the roof side zones for covering the sides of the objects and thence horizontally underneath the objects for covering the bottoms of the objects, said device comprising two guide



rails having free ends and extending parallel to the feed direction of the objects and which pass through the open axial edges of the two film web halves to engage the film web such that the free ends of the guide rails are at the ends of the base of the triangular zone and each guide rail engages a corresponding film web half at where the corresponding further zone extends downwardly from the corresponding roof side zone with said device being characterized by the fact that there are provided means for selectively spacing the guide rails in relation to each other dependent upon object size and means for selectively spacing the guide rails vertically in relation to the ridge edge line dependent upon the space between the guide rails as set by said means for spacing the guide rails relative to each other.

4,519,186

DEVICE FOR ATTACHING TUBULAR SEGMENTS OF PLASTIC FILM ON VESSELS

Horst Winter, Obertraubling, and Erich Eder, Donaustauf, both of Fed. Rep. of Germany, assignors to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik, Neutraubling, Fed. Rep. of Germany

Filed Feb. 28, 1983, Ser. No. 470,035

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1982, 3208234

Int. Cl.³ B65B *11/00, 13/00*

U.S. Cl. 53—585 **13 Claims**

1. Apparatus for depositing tubular segments of flexible material such as plastic film on a series of vessels as they move along a predetermined path, the apparatus comprising:

a rotor mounted for being driven rotationally in a vertical plane about a horizontal axis,

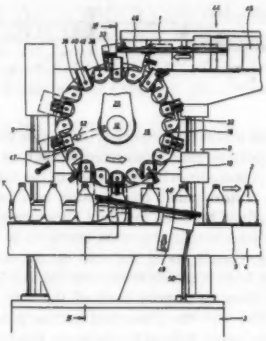
means for inserting tubular segments into a plane generally parallel to the rotational piane of said rotor,

means for moving said vessels along said predetermined path to said rotor,

a plurality of sucker means and a plurality of mandrel means respectively arranged alternately and generally in a circle on the rotor about the periphery thereof,

each sucker means comprising a pair of cooperating vacuum elements rotatable with said rotor in vertical planes and mechanism mounted on said rotor for swinging said vacuum elements along the rotational plane of the rotor alternately and cyclically in the direction of rotation of the rotor and oppositely of said direction and for moving at least one of said elements generally to the axis of rotor rotation to thereby cause said elements to cyclically move close together and separate in response to said rotor attaining different rotational positions, respectively,

each mandrel means comprising a pair of cooperating mandrel elements and a mechanism mounted on said rotor for swinging said mandrel elements along the rotational plane of the rotor alternately and cyclically in the direction of rotation of the rotor and oppositely of said direction and for moving at least one of said elements generally parallel to the axis of rotor to thereby cause said mandrel elements to cyclically move close together and separate in response



to said rotor attaining different rotational positions, respectively,

said rotational planes of said vacuum elements and mandrel elements being such that when the vacuum elements are together they grip opposite sides of a segment that is inserted between them, when said mechanism separates the vacuum elements they open the segment and align the opening with the mandrel means while said mandrel means are close together and the segment is swung by said mechanism over the mandrel means, and the mandrel elements are separated to effect gripping and transfer of the segment to the mandrel means, whereupon further rotation of said rotor effect transfer of the opened sleeve to a vessel moving in said path.

4,519,187

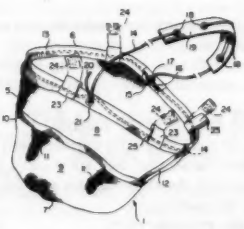
FLYGUARD

Jeannette Reynolds, 2711 Lindstrom Dr. NW., Calgary, Alberta, Canada T3E 6E5

Filed Nov. 22, 1983, Ser. No. 554,470

Int. Cl.³ B68B *7/00*

U.S. Cl. 54—81 **7 Claims**



1. A nose guard for horses for preventing flies and other

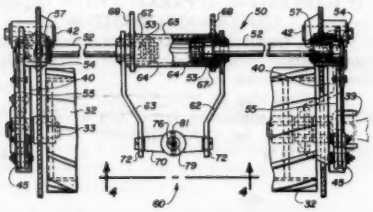
insects from entering the nostrils of the horse comprising a generally cylindrical body of meshed fabric with a closed generally hemispherical bottom portion for covering the muzzle including the nostrils of the horse, and a top portion formed of at least one generally rectangular panel secured along one of its longer edges to said bottom portion, border seam means of a substantially U-shaped cross-section secured along the other of the longer edges of said top portion, draw string means passing through said border seam means and extending out of said border seam means from one point therein and re-engaging said border seam means at a generally diametrically opposed point thereon, thereby forming a head strap for securing said guard in place whereby tightening of said draw string means simultaneously secures said guard on the head and tightens said guard aroung the muzzle of a horse, and a plurality of tabs secured to said border seam means for connection to a bit harness arrangement.

4,519,188

LINKAGE FOR EQUALIZING CONDITIONING ROLL PRESSURE

Emmett G. Webster, and Kenneth W. McLean, both of New Holland, Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Mar. 2, 1984, Ser. No. 585,673
Int. Cl.³ A01D *82/00*
U.S. Cl. 56—16.4 **10 Claims**



1. In a hy harvesting machine having a mobile frame; crop conditioning means supported by said frame to condition crop received thereby, said crop conditioning means having first and second cooperable conditioning members, said first conditioning member being movable relative to said second conditioning member and being biased toward a position relative to said second conditioning member, said first member having first and second opposing ends; crop cutting and conveying means supported by said frame to sever standing crop material and convey the severed crop material to said crop conditioning means, biasing means for biasing said first member toward said position relative to said second conditioning member, said biasing means having first and second biasing member connected to said first and second ends, respectively, to effect a respective biasing of the opposing ends of said first conditioning member toward said position relative to said second conditioning member, the improvement comprising:

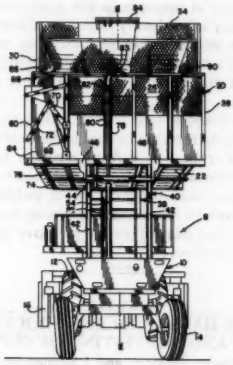
a biasing force equalization member having a first arm connected to said first biasing member, a second arm spaced from said first arm and connected to said second biasing member and a trunnion interconnecting said first and second members to permit a limited relative movement between said first and second arms in corresponding planes, allowing an equalizing of the biasing forces exerted by said biasing members on the respective opposing ends of the first conditioning member.

4,519,189

TELESCOPING BASKET COVER

Robert M. Fachini, Naperville; Jesse H. Orsborn, Clarendon Hills, and Monroe C. Barrett, Downers Grove, all of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Aug. 19, 1983, Ser. No. 524,791
Int. Cl.³ A01D *87/10, 46/08*
U.S. Cl. 56—16.6 **5 Claims**



1. In a cotton harvester having a wheeled chassis, a picking unit for harvesting cotton, and a unitary basket having a floor and upwardly extending wall for collecting cotton from said picking unit, said basket comprising:

a disassembleable roof section releaseably secured to said basket walls;

said roof section being uniformly adjacent to said basket walls;

raising means moving said basket between lowered and raised positions;

said raising means detachably secured to said roof section for telescopic movement of said section into and out of the space encompassed by said basket walls;

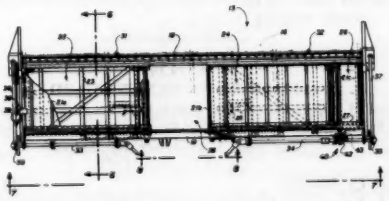
said raising means moving said roof section either together with or separately from said basket walls in a path being perpendicular to said chassis.

4,519,190

INTER-TROLLEY LATCH FOR DRAPER HEADER

Edward A. Blakeslee, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Sep. 16, 1983, Ser. No. 532,942
Int. Cl.³ A01D *35/14, 57/20*
U.S. Cl. 56—181 **5 Claims**



1. In a crop harvesting machine having a mobile frame adapted for movement across a field; a transverse header subframe connected to said mobile frame; first and second draper trolleys slidably mounted on said header subframe for independent lateral movement relative thereto, the summation of the transverse width of said first and second trolleys being less

than the transverse width of said header subframe, said trolleys being movable such that said first trolley is positionable in spaced relation to said second trolley as well as immediately laterally adjacent thereto; power means connected to said first draper trolley to effect the transverse sliding movement thereof relative to said header subframe, the improvement comprising:

latching means operatively connected to said second draper trolley to connect said second draper trolley to said first draper trolley in response to the positioning of said first draper trolley immediately laterally adjacent thereto;

release means connected to said latching means to selectively effect a release of said latching means to disconnect said second draper trolley from said first draper trolley; and

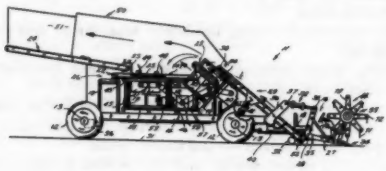
a spring clip affixed to said second trolley to be engageable with a retaining member on said header subframe to retain said second trolley in a fixed position relative to said subframe when said first trolley is disconnected from said second trolley, said spring clip being yieldable at a predetermined force to release said retaining member and permit said second draper trolley to move transversely on said header subframe.

4,519,191

STRAWBERRY HARVESTER AND PROCEDURES FOR GROWING AND HARVESTING OF SUCH FRUIT

Richard L. Ledebuhr, Haslett, and Clarence M. Hansen, East Lansing, both of Mich., assignors to Board of Trustees of Michigan State Univ., East Lansing, Mich.

Filed Mar. 7, 1984, Ser. No. 587,041
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—331 **5 Claims**



1. A harvester structure for the singulation of fruits from connective stems and separation from debris, comprising:

a moving openwork substantially horizontal bed conveyor;

a plurality of blowers beneath said conveyor in spaced-apart intervals and extending and raising said fruit above said conveyor across said moving bed;

a double-bladed hedger positioned selectively above and horizontally across said conveyor and positioned slightly downstream of the position of each of said blowers in respect to movement of said conveyor; and

debris removing means behind the most downstream of said double hedgers.

4,519,192

HOLD-DOWN SICKLE GUARD

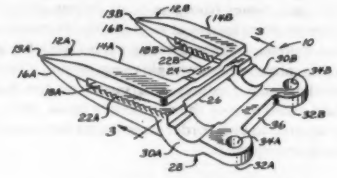
Fred H. Oppenhuisen, and Frank O. Allec, both of Buchanan, Mich., assignors to National-Standard Company, Niles, Mich.

Filed Mar. 5, 1984, Ser. No. 586,066
Int. Cl.³ A01D *55/08*
U.S. Cl. 56—298 **10 Claims**

1. A one-piece hold-down sickle guard for cooperating with a plurality of reciprocating sickle sections positioned on a cutterbar of a cutting implement and forming a plurality of cutting surfaces therewith and for protecting said sickle sections from damage, said hold-down sickle guard comprising:

a plurality of longitudinally extending guard members each including an upper body section and a lower body section in spaced relation so as to define a horizontal slot therebetween within which a respective sickle section is confined and freely movable, said upper and lower body sections coupled at respective forward portions thereof so as to form an integral guard member and wherein said lower body portions form cutting surfaces with immediately adjacent sickle sections;

mounting means coupled to an aft portion of said guard members for securely coupling said guard members to a cutterbar of said cutting implement; and



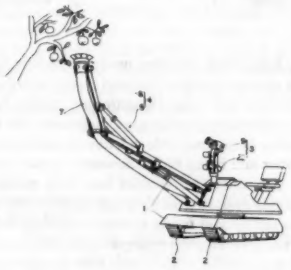
hold-down means formed into an aft portion of the upper body section of each of said guard members said hold-down means including a hold-down bar having a portion thereof projecting toward said lower body section of said guard member to provide a depressed area, with said depressed area for engaging and displacing the reciprocating sickle sections toward the corresponding lower body section of said guard member so as to maintain a predetermined cutting cooperation and clearance between said sickle sections and said sickle guard.

4,519,193

FRUIT HARVESTING APPARATUS WITH TELEVISION CAMERA AND MONITOR

Jituo Yoshida, Izumi; Shigeaki Okuyama, Kawachinagano, and Hiroshi Suzuki, Tondabayashi, all of Japan, assignors to Kubota, Ltd., Osaka, Japan

Filed May 19, 1983, Ser. No. 496,218
Claims priority, application Japan, Aug. 11, 1982, 57-140021
Int. Cl.³ A01D *46/00*
U.S. Cl. 56—328 R **6 Claims**



1. A fruit harvesting apparatus comprising:

means for searching and detecting the positions of fruit including a TV camera with a variable shooting direction, a TV monitor for said camera, spot light emitting means for emitting light and means for varying the shooting direction of said camera and the direction of the emitted light and position of said spot emitting means in response to instructions supplied thereto;

movable means for picking fruit; and

control means for supplying instructions for movement to said TV camera and spot light emitting means, for determining the position of a detected fruit from the direction of shooting of said camera, the position of said spot light emitting means and direction of light emitted by said spot light emitting means by triangulation and causing move-

ment of said fruit picking means to the position of a detected fruit.

4,519,194

HAY HARVESTING MACHINE

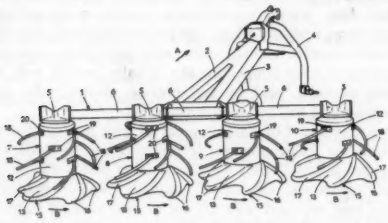
Jerome Aron, Bouxwiller, and Michel Quirin, Wasselonne, both of France, assignors to Belrecolt S.A., Marmoutier, France

Filed Jul. 1, 1983, Ser. No. 510,268

Claims priority, application France, Jul. 8, 1982, 82 12159

Int. Cl.³ A01D *78/12*

U.S. Cl. 56—370 **7 Claims**



1. A hay harvesting machine for windrowing hay, moving swaths of hay, tedding hay and the like

comprising in combination

at least one drum having a base and a wall, and being rotatable about a substantially upright axis in a predetermined direction,

a flexible skirt connected to said base for sweeping up the hay, said skirt having substantially the shape of a truncated cone and including a plurality of ribs each having a predetermined curvature,

a plurality of arms arranged in a plurality of rows along said wall and extending therefrom,

each arm having a curvature substantially the same as the curvature of each rib so as to cooperate with said skirt for further movement of the hay,

at least the arms of the row nearest to said skirt extending in a direction substantially parallel to said skirt wherein the spacing of said skirt from each arm of the row nearest said skirt is at least 5 cm.

4,519,195

HELICAL WRAPPING OF TAPE

Rudolf E. Belin, Freshwater Creek; William F. Boyce, Buckley, and John D. Feehan, Belmont, all of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

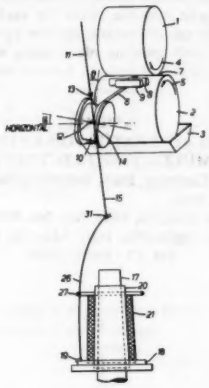
Filed Aug. 18, 1983, Ser. No. 524,502

Claims priority, application Australia, Aug. 18, 1982, PF5453

Int. Cl.³ D02G *3/36, 3/06, 3/08, 3/40*

U.S. Cl. 57—3 **8 Claims**

1. A system for helically wrapping a tape comprising, tape twisting means, and, upstream of the twisting means, means for shaping the tape, said shaping means comprising a body over which the tape passes, said body being defined by the locus of a line moved at least partially around an axis, said line comprising a first portion extending generally parallel to said axis and an arcuate portion extending from an end of the first portion in a direction away from said axis, whereby said first portion defines a first surface of at least partially cylindrical form and said second portion defines an outwardly curved edge surface extending along a side of the first surface, and tape supply means for feeding the tape onto the first surface such that the tape is inclined to a plane at right angles to the axis of the first



surface whereby an edge of the tape engages the curved edge surface and is thereby shaped in order to initiate wrapping.

4,519,196

WRAPPED YARN SPINNING MACHINE WITH SEVERAL SPINNING PLACES

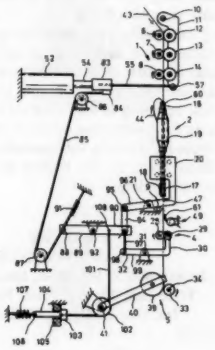
Fritz Stahlecker, Bad Ueberkingen, Fed. Rep. of Germany, assignor to Hans Stahlecker, Sussen, Fed. Rep. of Germany, a part interest

Filed Sep. 29, 1982, Ser. No. 426,931

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139394

Int. Cl.³ D02G *3/36;* **D01H** *13/16*

U.S. Cl. 57—18 **12 Claims**



1. A wrapped yarn spinning machine having several spinning places, each spinning place comprising a drive means for rotatably driving a hollow spindle means, a hollow spindle means operatively connected with the drive means and having an inlet end, a binding thread rotating in unison with and carried by said hollow spindle means, a delivery means for at least one sliver to be wrapped by spinning and a take-off means for the wrapped yarn, the hollow spindle means being arranged between the delivery means and the take-off means, false twist means associated with the hollow spindle means, and yarn detecting means for detecting the yarn tension and operable to individually shut down a respective spinning place by interruption of the sliver feed and of the drive means of the

hollow spindle means in case of breakage of the binding thread and/or the sliver, the false twist means associated with the hollow spindle means of each spinning place being arranged at the inlet end of the hollow spindle means and being operable to impart a false twist into the sliver for each rotation of the respective hollow spindle means, and the yarn detector means associated with each spinning place being arranged between the hollow spindle means and the take-off means.

4,519,197

METHOD AND APPARATUS FOR LAYING-UP CORES OF A MULTI-CORE ELECTRIC CABLE

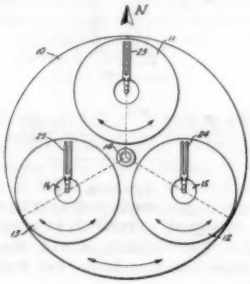
Andrea Borroni, Carimate, Italy, assignor to Societa Cavi Pirelli S.p.A., Milan, Italy

Filed Mar. 19, 1984, Ser. No. 590,731

Claims priority, application Italy, Mar. 24, 1983, 20252 A/83

Int. Cl.³ D07B *3/06*

U.S. Cl. 57—64 **10 Claims**



1. A process for the laying-up of a plurality of elongated cylindrical bodies without significant torsion thereon after they have been layed-up, said process comprising:

providing a plurality of windings of said bodies, one winding for each body and the body of each winding being substantially free of torsion;

removing each body from its winding and supplying each of said bodies to a laying-up member while rotating said windings in a first direction and rotating said windings, as a group, around an axis common to the group, in a second direction opposite to said first direction; and

maintaining the orientation of the point of separation of each body from its winding substantially constant with respect to a fixed point as the bodies are removed from their respective windings.

4,519,198

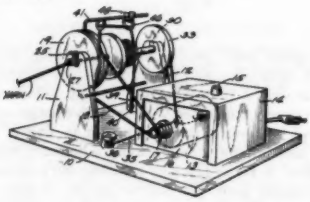
YARN SPINNER

Thomas L. Kissel, 606 S. Rural St., Hartford, Wis. 53027

Filed Sep. 12, 1983, Ser. No. 531,449

Int. Cl.³ D01H *3/00, 7/26, 7/36*

U.S. Cl. 57—71 **2 Claims**



1. A yarn spinner comprising:

a wooden base,

a pair of upstanding wooden posts mounted to said base and spaced from each other, each of said posts having a slot aligned with the other and at substantially the same distance above the base, the said slots providing bearing surfaces,

spindle means including a tubular shaft member providing an orifice at one end for entering yarn and having an opposite end, said shaft member having a radial hole for the yarn to exit, and including another shaft member for supporting a bobbin joined coaxially to said tubular shaft member at said opposite end to thereby provide a unitary spindle shaft assembly whose opposite ends can be dropped in said slots in the posts, respectively, to journal said assembly for rotation,

a spindle pulley means fastened concentrically to said tubular shaft member and comprised of two concentric interfacing wooden discs bonded together, one of the discs having a peripheral groove for a driving belt to run in, at least one of said discs having a continuous groove in its surface that interfaces with the other, said groove including two diametrically opposite radially outwardly extending portions and a curved portion connecting the radially inward ends of said two portions, said curved portion allowing for passing around said tubular shaft member,

a flyer composed of a single piece of wire having two axially extending guide portions terminating in free ends and arranged in parallelism with each other and with the axis of said shafts and substantially equally radially spaced from said axis, and said wire having an intermediate portion disposed between said axially extending portions, said intermediate portion having a shape that is complementary to the shape of said groove at the interfaces of said disc and is registered in said groove for said flyer to rotate with said pulley means,

a distributor device mounted on one of said axially extending wire portions of said flyer for being moved axially thereof and having means for spun yarn to pass through for being directed to selected regions along a bobbin supported on said shaft, and

an electric motor having a shaft and a pulley thereon for a belt that couples said pulley in driving relation with said spindle pulley means.

4,519,199

DEVICE FOR INTERRUPTING THE FEED OF A ROVING TO THE DRAWING FRAMES OF A SPINNING MACHINE

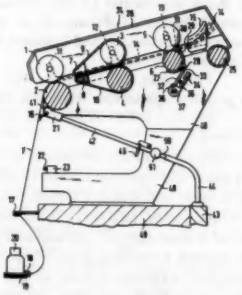
Norbert Barauke, Donzdorf, Fed. Rep. of Germany, assignor to Spindelfabrik Sussen, Schurr, Stahlecker & Grill GmbH, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,999

Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119408

Int. Cl.³ D01H *13/16, 13/18, 5/66*

U.S. Cl. 57—87 **9 Claims**



1. The device for interrupting the feed of a roving to a drawing frame of a spinning machine of the type having a

plurality of drawing frames, each of the drawing frames including a plurality of upper and lower forward, middle and rear drawing rollers disposed pairwise, comprising:

a clamping segment disposed on one of said drawing rollers adjacent a feed side of the roving, said clamping segment being movable from an operative position permitting driving of said drawing rollers and feed of said roving to an interrupting position interrupting feeding of said roving,

broken-end detector means for monitoring breaks in thread spun on the drawing frame,

electric means for controlling movement of said clamping segment between said operative and said interrupting positions,

control means for controlling said electric means to move the clamping segment to said interrupting position in response to detection of a broken thread by said broken-end detector means, and

suction means associated with the drawing rollers on the thread formation side of the drawing frame for collecting rovings present in the respective drawing frame when the roving feed thereto is interrupted, said suction means including a suction device disposed in the vicinity of the forward lower drawing roller and mounted for movement away from said forward lower drawing roller, said suction device cooperating with said broken-end detector means and being lockable in respective operating and nonoperating positions.

4,519,200

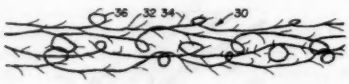
TEXTILE YARNS WITH LOOPS AND FREE PROTRUDING ENDS

Bobby M. Phillips, Kingsport, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 22, 1983, Ser. No. 525,388

Int. Cl.³ D02G *3/24, 1/16*

U.S. Cl. 57—246 **5 Claims**



1. A textile yarn having a staple yarn character and including continuous filaments, each continuous filament formed into coils, loops or whorls at random intervals along its length and comprising a continuous main body section having a portion thereof along the length of the main body section being intermittently separated from the main body section and a fraction of said intermittently separated portion being broken and providing free ends extending from said main body section.

4,519,201

PROCESS FOR BLENDING FIBERS AND TEXTILES OBTAINED FROM THE FIBER BLENDS

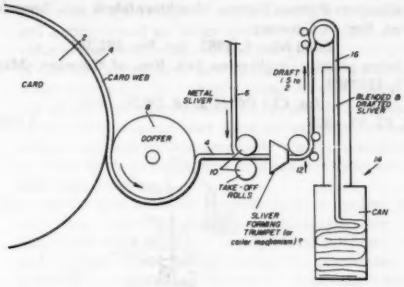
John J. Toon, 2200 Piedmont Rd. NE., Marietta, Ga. 30062

Filed Sep. 8, 1982, Ser. No. 415,937

Int. Cl.³ D02G *3/12, 3/04;* D01G *13/00*

U.S. Cl. 57—252 **8 Claims**

4. A yarn comprised of a blend of a first group of fibers with a high modulus of elasticity and a second group of fibers with a low modulus of elasticity, the fiber length distribution of the high modulus fibers in the blend being substantially uniform



and the length of the high modulus fibers ranging therein between about 2 mm and about 30 mm.

4,519,202

SPINNING OR TWISTING MACHINE, ESPECIALLY FOR GLASS-FIBER THREADS

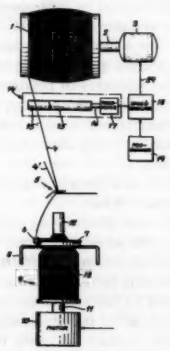
Gerd Hausner, Albershausen, and Rolf Semmelrodt, Ebersbach, both of Fed. Rep. of Germany, assignors to Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,868

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212084

Int. Cl.³ D01H *13/10, 13/20*

U.S. Cl. 57—264 **14 Claims**



1. In textile machines comprising first drive means for rotating a supply bobbin from which a thread is being drawn through a traveler onto a cop on a spindle rotated by second drive means,

the combination therewith of:

monitoring means disposed between said supply bobbin and said traveler for generating a velocity-measuring signal indicative of the rate of advance of a thread being payed out by the bobbin; and

speed-regulating means coupled with said first drive means and responsive to said velocity-measuring signal for controlling the rotation of said supply bobbin to maintain said rate of advance at a prescribed value.

4,519,203
YARN TWISTING METHOD AND APPARATUS

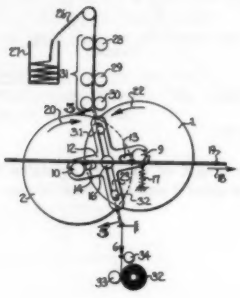
Heinz Schippers, Remscheid-Lennep, Fed. Rep. of Germany, assignor to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,241

Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217083

Int. Cl.³ D01H *5/28*; D02G *1/08*

U.S. Cl. 57—328 **9 Claims**



1. A method of twisting a yarn sliver composed of staple fibers, and comprising the steps of

providing a pair of twist imparting circular discs, with each disc including a yarn engaging friction surface, and with at least one of said discs being relatively thin and flexible, and with said discs being mounted for rotation about parallel spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship,

providing a first pressure applying member positioned intermediate said axes of rotation of said discs and on one side of the plane defined by such axes of rotation, and so as to locally bias said one flexible disc toward the other disc and thereby define a first twisting zone,

providing a second pressure applying member positioned intermediate said axes of rotation and on the side of the plane defined by such axes opposite said first pressure applying member, and so as to locally bias said one flexible disc toward the other disc and thereby define a second twisting zone,

rotating each of said discs in opposite directions about their respective axes, while

advancing the yarn sliver along a path of travel and including drafting the advancing sliver to obtain a desired density and then advancing the drafted sliver serially through said two twisting zones in a direction perpendicular to the plane defined by the axes of rotation of said discs so as to have twist imparted thereto at each of said twisting zones by frictional contact between the yarn sliver and the respective opposed friction surfaces resulting from the force exerted by said pressure applying member at each twisting zone, and

controlling the actuation of said first and second pressure applying members to apply opposite twisting forces to the advancing yarn sliver, with such twisting forces applying twist of one direction upstream of the first pressure applying member and applying twist of the opposite direction between the first and second members.

2. A method of twisting a yarn and comprising the steps of

providing a pair of twist imparting circular discs, with each disc including a yarn engaging friction surface, and with at least one of said discs being relatively thin and flexible, and with said discs being mounted for rotation about parallel spaced apart axes and such that portions of the respective yarn engaging friction surfaces are disposed in opposing, face to face relationship,

providing a first pressure applying member, with said first pressure applying member being positioned intermediate said axes of rotation of said discs and on one side of the plane defined by such axes of rotation, and so as to locally bias said one flexible disc toward the other disc and thereby define a first twisting zone,

providing a second pressure applying member, with said second member being positioned intermediate said axes of rotation and on the other side of the plane defined by such axes, and so as to locally bias said one flexible disc toward the other disc and thereby define a second twisting zone,

adjusting the biasing force of each of the first and second pressure applying members so as to impart a predetermined biasing force at each of said twisting zones,

rotating each of said discs in opposite directions about their respective axes, while

advancing a yarn along a path of travel so as to move serially through said first and second twisting zones with S twist being imparted at one of the zones and Z twist being concurrently imparted at the other of the zones, and with the degree of twist imparted at each of said twisting zones being determined by the adjustment of the biasing force.

4,519,204
YARN FALSE TWISTING APPARATUS

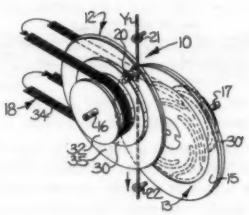
Peter Dammann; Hellmut Lorenz, both of Remscheid, and Roland Maier, Radevormwald, all of Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik AG, Remscheid, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,795

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1981, 3140261; Oct. 14, 1981, 3140856; Dec. 4, 1981, 3147966

Int. Cl.³ D02G *1/08*

U.S. Cl. 57—340 **33 Claims**



1. A circular disc adapted for use in a yarn false twisting apparatus of the like and which is characterized by the ability to be rotated at a relatively high speed and be laterally flexed into firm engagement with a running yarn or the like by a relatively small lateral biasing force, said disc comprising a sheet of thin springy material and which includes

a hub portion disposed adjacent the center of the disc,

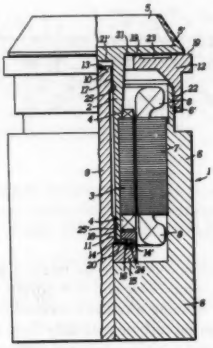
an annular ring disposed concentrically about said hub portion and including a yarn engaging friction surface on one face thereof, and

distinct junction means joining said hub portion and said annular ring, with said junction means being substantially weaker than the remaining portions of said sheet, and such that the annular ring is adapted to readily flex in the lateral direction with respect to said hub portion and a rotating torque may be transmitted to the annular ring without significant circumferential deformation.

4,519,205
DRIVE AND MOUNTING FOR AN OPEN-END SPINNING UNIT

Hans-Rudolf Gubler, Gebenstorf, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Dec. 15, 1982, Ser. No. 449,999
Claims priority, application Switzerland, Dec. 22, 1981, 8195/81
Int. Cl.[3] D01H 7/882
U.S. Cl. 57—406 11 Claims



1. An open end spinning device, comprising:
a spinning container;
an electric motor housing having a bore and on which said container is mounted;
a laminated stator mounted in said bore of said housing;
a laminated rotor mounted within said stator, said rotor being mounted on a hollow shaft closed at an end nearest said spinning container, said hollow shaft having a first and second working surface at open and closed ends thereof, respectively, and wherein said rotor includes a rotor winding;
a spinning container located on one end of said hollow shaft and connected to said rotor; and
radial bearing journal means in said hollow shaft for radially guiding the rotation of said rotor, said radial journal means being fixed to said housing and extending the length of said bore;
wherein said radial journal means further comprises a first gas dynamic radial bearing located at the spinning container side thereof and having a working surface engageable with said first working surface of said hollow shaft and a second gas dynamic radial bearing having a working surface engageable with said second working surface of said hollow shaft and wherein said container, said hollow shaft, said rotor and said rotor winding are removable as a unit from said bore.

4,519,206
MULTI-FUEL ROTARY POWER PLANTS USING GAS PISTONS, ELLIPTIC COMPRESSORS, INTERNALLY COOLED THERMODYNAMIC CYCLES AND SLURRY TYPE COLLOIDAL FUEL FROM COAL AND CHARCOAL

Christopher van Michaels, 1817¼ N. Las Palmas Ave., Los Angeles, Calif. 90028

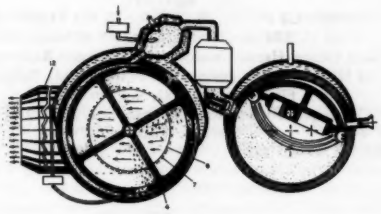
Filed Jun. 5, 1980, Ser. No. 156,563
Int. Cl.[3] F02C 7/00
U.S. Cl. 60—39.54 4 Claims

1. A continuous combustion chamber rotary power plant using: a colloidal carbonaceous fuel, a special elliptically shaped rotary compressor, gas pistons, a circular rotary device housing said gas pistons and special internally cooling thermodynamical cycles comprising:

(1) a rotary compressor, based on my rotary centers of the ellipse, having an elliptical stator housing with an air inlet and a compressed air outlet opposite the air inlet, a check valve in said compressed air outlet to prevent reverse flow of the air, said compressor further having an elliptical rotor, suspended on a shaft passing mandatory through one of the two rotary centers of the elliptic cross section of the stator housing, said rotor having also two sets of sealing elements located on the sides and the ends of the elliptical rotor to form a gas tight seal between the rotor and stator housing;

(2) a combustion chamber surrounded by a cooling jacket receiving compressed air from said compressed air outlet, said combustion chamber having a fuel injection means and ignition means for the continuous combustion of a colloidal carbonaceous fuel with the compressed air, said combustion chamber further having a combustion gas outlet for directing the combustion gases to said circular rotary device;

(3) said circular rotary device housing the gas pistons, having a circular stator housing and a water jacket surrounding approximately half of the engine's stator housing, said water jacket being in fluid communication with the cooling jacket of the combustion chamber, said stator housing having a combustion gas inlet in communication with the combustion gas outlet of said combustion chamber and an exhaust gas outlet located in the center of stator housing, said water jacket further being located such that it surrounds the portion of the stator housing closest to the combustion gas inlet, said rotary engine further having a hollow cylindrical rotor having inlet ports along the rotor's periphery and being in fluid flow communication with the exhaust gas outlet of the stator housing, said hollow cylindrical rotor also having at least two radially extending rib wall portions dividing the rotor's hollow interior into at least two equal volume compartments such that combustion gases pass through the rotor's inlet ports strike the rotor's rib walls which directs the gas propagation toward stator's central exhaust outlet, forcing the gas to acquire a rotating spiral propagation shape, fitted inside the rotary volume compartments between the inlet ports, the ribs and the rotor's central exhaust outlet, more precisely the gas rotation acquiring a decreasing spiral path which together with the unavoidable and concurrent intervention of the law of the conservation of the angular momentum of the spirally spinning gas causes the gas to continuously push the rotor's ribs and act upon them like rotating gas pistons, till the exhaust of the rotating gas, causing the rotor to rotate as the combustion gases exit through the stator's central exhaust gas outlet,



(4) said rotary engine further having means for internal cooling and deriving from the cooling additional work through converting the classic thermodynamical cycles into the better internally cooling thermodynamical cycles, performed by enabling the engine to preheat the water of the cooling means to boiling temperature inside the engine's jackets and exhaust pipe, then injecting that hot water, through means for injecting, into the stator housing diametrically opposite the rotary engine's combustion gas

inlet, where said injected hot water becomes instantly vaporizing and preheated by the combusted gases, thus obtaining while cooling additional motive fluid force on the rotor's rib walls, which changes the classic thermodynamical cycles into the more heat efficient, steam and combustion gases mixed, internally cooling cycles without the need for boilers, the vaporized water then exiting through the stator's central exhaust gas outlet;

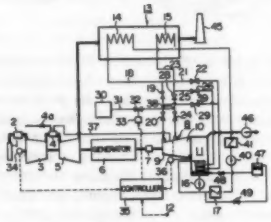
(5) a power output shaft, suspending the engine's rotor inside the engine's circular stator housing, connected with the shaft of the elliptical compressor, with the fuel injection means, with the ignition means and with the hot water injection means, to drive the air compressor, the fuel injection, the ignition, the hot water injection prompting the new thermodynamical cycles, said power output shaft providing also drive and additional energy from the mixed gas and steam pistons and cycles for universal use and multi-fuel application of said continuous combustion chamber of this new power plant.

4,519,207

COMBINED PLANT HAVING STEAM TURBINE AND GAS TURBINE CONNECTED BY SINGLE SHAFT

Akira Okabe; Haruo Urushidani, and Katsuto Kashiwahara, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 27, 1982, Ser. No. 452,935
Claims priority, application Japan, Dec. 29, 1981, 56-210662
Int. Cl.³ F02C *6/18*
U.S. Cl. 60—39.182 **6 Claims**



1. A combined plant comprising a gas turbine, steam turbine and a waste heat recovery boiler using exhaust gases of said gas turbine as a heat source for producing steam serving as a drive source of said steam turbine, said gas turbine and said steam turbine being connected together by a single shaft, wherein the improvement comprises:

an ancillary steam source;

ancillary steam line means connected to steam line means for introducing the steam generated by said waste heat recovery boiler to said steam turbine;

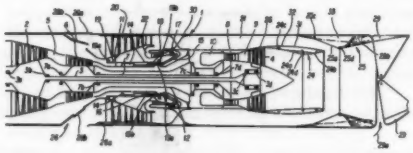
an ancillary steam control valve mounted in said ancillary steam line means whereby ancillary steam can be introduced through said ancillary steam line means into said steam turbine when said plant is started, to thereby avoid overheating of the steam turbine; and bypass line means for routing steam from the waste heat recovery boiler to a condenser by bypassing the steam turbine until the steam generated in the waste heat recovery boiler reaches a satisfactory condition at plant startup.

4,519,208

PROPULSION ENGINE, PARTICULARLY FOR SUPERSONIC AIRCRAFT

Jean M. Loisy, Saint Fargeau-Ponthierry, and Claude C. F. Menioux, Nogent sur Marne, both of France, assignors to S.N.E.C.M.A., Paris, France

Filed Sep. 21, 1982, Ser. No. 420,914
Claims priority, application France, Sep. 25, 1981, 81 18070
Int. Cl.³ F02K *3/06*
U.S. Cl. 60—262 **12 Claims**



1. A supersonic aircraft propulsion engine comprising:

at least one compressor rotatable about an engine axis;

a variable geometry internal nozzle coaxial with said compressor;

an internal envelope defining an internal gas flow path connecting said compressor and said nozzle, said internal envelope further defining a radially tapered portion;

at least one internal turbine rotatably fixed to said at least one compressor and positioned in said internal flow path;

an internal combustion chamber in said internal flow path and positioned between said tapered portion and said internal turbine, said compressor, internal nozzle, internal flow path, internal turbine and internal combustion chamber defining an internal propulsion system;

an external propulsion system at least partially concentrically positioned on the outside of said radially tapered portion, said external propulsion system comprising means for diverting any adjustable fraction of gas from said internal flow path to an external flow path whereby no external compressor is required, at least one external combustion chamber in said external flow path, at least one external turbine downstream from said external combustion chamber in said external flow path, a blower rotatably driven by said external turbine, and an external variable geometry nozzle downstream from said external turbine and said blower in said external flow path, said external nozzle being concentrically radially outside of, and downstream from, said internal nozzle; and

an external engine pod coaxial with, and radially surrounding said internal and external propulsion systems, said pod and internal envelope together defining an external annular conduit forming that portion of said external flow path between a confluence from said external turbine and blower at one end, and said external nozzle at a second end, said external turbine and blower both providing flow into said annular conduit.

4,519,209

HYDRAULIC MOTOR BYPASS APPARATUS

Charles M. Kline, Reinholds, Pa., assignor to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 177,147, Aug. 11, 1980, Pat. No. 4,384,455.
This application Oct. 18, 1982, Ser. No. 434,809
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—433 **7 Claims**

1. In combination with a feed device adapted to be driven by a fluid motor, apparatus comprising:

a rotatable shaft;

a driven member rotatably mounted on said shaft;

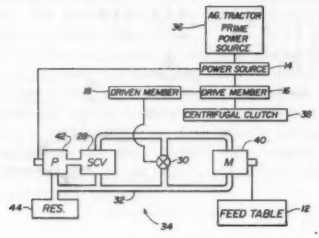
a pair of spaced plates connected to said driven member;

opposed friction pads mounted on said spaced plates;

means connected for rotating with said shaft, said means including a disc engaged between said pads;

means for urging said pads into engagement with said disc;

a valve in fluid communication with said fluid motor for permitting fluid to bypass said fluid motor, said valve having an inlet, an outlet and a fluid passageway interconnecting said inlet and outlet;



said shaft rotatably extending through said valve and said passageway;

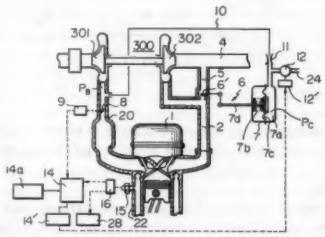
means on said shaft for blocking fluid passage through said passageway to thereby close said valve and cause fluid to be directed to said fluid motor to drive said feed device.

4,519,210

TURBOCHARGED INTERNAL COMBUSTION ENGINE WITH APPARATUS FOR CONTROLLING SUPERCHARGING PRESSURE

Kenji Iwamoto, Nishio; Kouichi Moriguchi, Nagoya, and Ryuiti Matusiro, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 18, 1983, Ser. No. 485,890
Claims priority, application Japan, Apr. 19, 1982, 57-65013
Int. Cl.³ F02B *37/12*
U.S. Cl. 60—602 **13 Claims**



1. An internal combustion engine comprising:

an engine body;

an intake system for introducing a combustible mixture into the engine body;

a throttle valve arranged in the intake system;

an exhaust system for removing exhaust gas from the engine body;

a supercharger having a turbine arranged in the exhaust system and a compressor arranged in the intake system at a position upstream of the throttle valve;

a bypass conduit connected to the exhaust system so as to bypass the turbine;

a bypass valve for controlling the amount of opening of the bypass conduit;

an actuator means for operating the bypass valve for controlling maximum exhaust flow to the turbine thereby controlling the maximum value of the intake system pressure at an outlet of the compressor;

means for detecting a knocking condition of the engine;

means for detecting an acceleration condition of the engine;

means for maintaining the maximum value at a first value when the engine is in a steady state;

first operating means, responsive to signals from the acceleration detecting means, for increasing the maximum value from said first value to a second value when the engine is in an acceleration condition; and

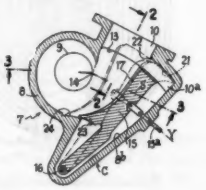
second operating means, responsive to signals from the knocking condition detecting means, for cancelling the operation of the first operating means thereby causing said maximum value to be said first value.

4,519,211

SUPERCHARGER DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Marcel Sédille, Paris, and Maurice Le Creurer, Taverny, both of France, assignors to Automobiles Peugeot/Automobiles Citroen, France

Filed May 27, 1983, Ser. No. 498,696
Claims priority, application France, Jun. 3, 1982, 82 09652
Int. Cl.³ F01D *17/17*; F02B *37/12*
U.S. Cl. 60—602 **7 Claims**



1. A turbine for a turbocompressor of a supercharger device of an internal combustion engine, said turbine comprising a turbine wheel, a housing wall internally defining a first part of a scroll in which said turbine wheel is mounted to be rotatable about an axis, said housing wall further defining an aperture laterally disposed relative to said wheel and scroll, a flap movably mounted in said aperture and having a concave surface which defines a second part of said scroll completing said scroll with said first part, said scroll having an inlet for exhaust gases from said engine and a partition element dividing said inlet into two conduits which are respectively for connection to two exhaust pipes, each pipe being connected to exhaust outlets of a respective group of cylinders of the engine, said flap being movable in said aperture between a withdrawn position in which withdrawn position said concave surface of said flap defines a given section of passage of a part of the scroll adjacent to said inlet and a position in which said flap projects from said aperture and said concave surface of said flap defines a section of passage which is smaller than said given section of said part of the scroll adjacent to said inlet, said flap having two extension portions which are respectively cooperative with said two conduits so as to substantially completely open said conduits in said withdrawn position of said flap and to partly close said conduits in said projecting position of said flap.

4,519,212

BOILER-DRIVEN POWER GENERATOR

Shye-Yih Deng, 10-4 Fl., No. 62, Chang-Chun Rd., Taipei, Taiwan

Filed Apr. 19, 1982, Ser. No. 370,451
Int. Cl.³ F01K *11/00*
U.S. Cl. 60—669 **1 Claim**

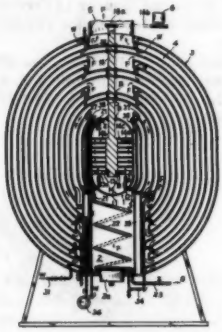
1. A boiler-driven power generator being formed within a vaporizing chamber of a boiler which comprises:

a plurality of water jackets disposed around said central

vaporizing chamber positioned atop on a combustion chamber;

a plurality of sandwiched flues each respectively partitioned between each two neighboring water jackets; several atomizers respectively connected to an innermost water jacket communicated with said water jackets; and a steam pipe, poking into said vaporizing chamber, which is connected with a coil formed in said combustion chamber and a discharge pipe for discharging end use, the improvement which comprises:

a rotor pivotedly installed in a casing of said vaporizing chamber of the boiler and extending several blades therefrom; several diaphragms respectively extending inwards from the casing of said vaporizing chamber, each diaphragm partitioning the two neighbouring blades of said



rotor and each diaphragm being formed with several nozzles thereon for passing steam therethrough;

a transmission shaft connected to one end of said rotor and terminated with a gear and a chain to couple a power generator; and a defining plate being positioned beyond said atomizers inserted into said vaporizing chamber of the boiler for rotatably mounting another end of said rotor, and formed with several injection holes for passing steam sprayed and vaporized from said atomizers,

whereby the feed water is heated when passing through said water jackets and sprayed through said atomizers to vaporize as steam to force said blades to rotate said rotor and transmission shaft for driving said power generator and the exhausted steam from said vaporizing chamber is led into said steam pipe, coil and discharged through said discharge pipe.

4,519,213

AMBIENT AIR HEATED ELECTRICALLY ASSISTED CRYOGEN VAPORIZER

William D. Brigham, Huntington Beach, and Nguyen D. Dung, Fullerton, both of Calif., assignors to Zwick Energy Research Organization, Inc., Huntington Beach, Calif.

Filed Aug. 1, 1983, Ser. No. 519,113
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—52 **21 Claims**

1. A cryogen vaporizer comprising:

a radiator for placing a first working fluid in heat exchanging contact with ambient air;

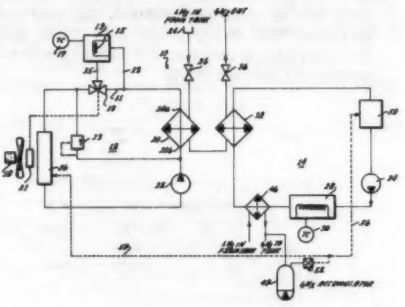
a first heat exchanger for placing a cryogen in heat exchanging contact with said first working fluid to thereby vaporize said cryogen;

means defining a first loop for circulating said first working fluid through said radiator and said first heat exchanger;

reservoir means for storing a quantity of working fluid;

heater means for heating working fluid stored in said reservoir means;

conduit means connecting said reservoir to said first loop; and



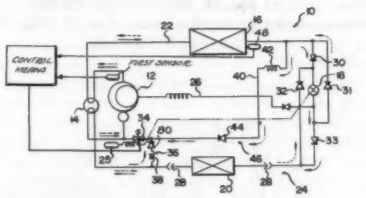
normally closed valve means actuatable for releasing heated working fluid stored in said reservoir through said conduit means into said first loop to thereby defrost said radiator.

4,519,214

AIR CONDITIONER

Tetsuo Sano, Fujinomiya; Susumu Orita, Fuji; Masaya Yamazaki, Shimizu, and Kazuhiro Moriyama, Fuji, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 30, 1983, Ser. No. 567,344
Claims priority, application Japan, Jan. 17, 1983, 58-5479
Int. Cl.³ F25D *21/06*; F25B *13/00*
U.S. Cl. 62—156 **5 Claims**



1. An air conditioner capable of operating in either a cooling mode or a heating mode, as well as in a defrosting mode, comprising:

a compressor;

a four-way valve, connected between the exhaust side and the suction side of the compressor, adapted to be switched between a cooling position and a heating position;

an outdoor side heat exchanger connected to one side of the four-way valve;

a first indoor side heat exchanger connected to the other side of the four-way valve;

an expansion valve, connected between the outdoor side heat exchanger and the indoor side heat exchanger, having a throttling amount that is regulated in response to coolant temperature;

a switching control valve, connected to the suction side of the compressor;

a first sensor for detecting pressure at said high pressure side during heating mode operation;

a second sensor for detecting coolant temperature in said outdoor side heat exchanger during heating mode operation;

a first branch passage connected at a first end thereof between the four-way valve and the indoor side heat exchanger and at a second end thereof to the switching control valve at the side of the switching control valve

furthest from said suction side of said compressor, for releasing high pressure produced between the four-way valve and the indoor side heat exchanger, when the switching control valve is opened, during heating mode operation;

a second branch passage, connected at a first end thereof between outdoor side heat exchanger and the expansion valve and at a second end thereof to the switching control valve, for shortcircuiting refrigerant during defrosting mode operation; and

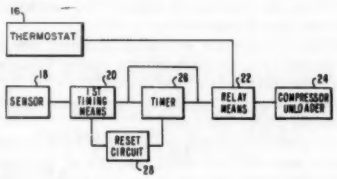
control means, responsive to said first and second sensors, for (1) opening the switching control valve when high pressure is produced at a high pressure side of the air conditioner during heating mode operation to produce a shortcircuit through said first branch passage, and (2) opening the switching control valve during defrosting mode operation to produce a shortcircuit through said second branch passage.

4,519,215

TRANSPORT REFRIGERATION SYSTEM WITH TOP FREEZING AVOIDANCE

Joe R. Barnett, Minneapolis, Minn., assignor to Thermo King Corporation, Minneapolis, Minn.

Filed Feb. 14, 1984, Ser. No. 579,930
Int. Cl.[3] G05D *23/19;* F25B *1/00*
U.S. Cl. 62—158 **3 Claims**



1. Control apparatus for reducing top freezing probability of fresh cargo adjacent the path of refrigerated air discharged from a transport refrigeration unit having normal refrigerating capacity in one mode, and reduced refrigerating capacity in another mode, comprising:

means for sensing the temperature of said discharge air and providing a signal reflecting that temperature;

timing means actuated by said signal and operable in response to said signal indicating a discharge temperature below a predetermined temperature capable of causing top freezing after a given period, to provide time periods of progressively shorter duration, with progressively lower sensed discharge air temperatures, of operation of said unit in said normal capacity mode;

means responsive to the expiration of any of said time periods to shift said unit to said reduced capacity mode; and

thermostatic means for sensing the temperature of cargo air returning to said unit and for normally controlling said unit to a set point temperature.

4,519,216

SELF CONTAINED INDIRECT REFRIGERATION SYSTEM

Joseph A. Felicetta, 25 Eastlyn Dr., Bardonia, N.Y. 10954

Filed Dec. 23, 1982, Ser. No. 438,368
Int. Cl.[3] F25D *17/02*
U.S. Cl. 62—185 **7 Claims**

1. A refrigeration system for cooling a storage area through a cooling means in the storage area, comprising:

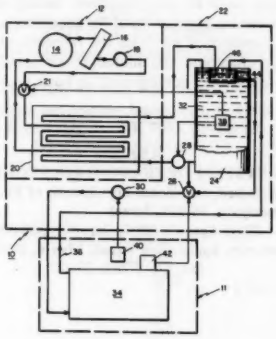
(a) a refrigeration means for cooling a coolant passing therethrough to a predetermined temperature;

(b) a coolant storage means for the coolant, the storage means comprising a primary and secondary coolant storage means;

(c) means for selectively conveying coolant from the primary coolant storage means directly to the refrigeration means for cooling the coolant to the predetermined temperature;

(d) means for returning the coolant from the refrigeration means directly to the primary coolant storage means;

(e) means for selectively conveying coolant from the primary coolant storage means to the cooling means for the storage area;



(f) means for conveying the coolant from the cooling means, after it has cooled the storage area and had its temperature raised to a temperature greater than the predetermined temperature, to the secondary coolant storage means; and

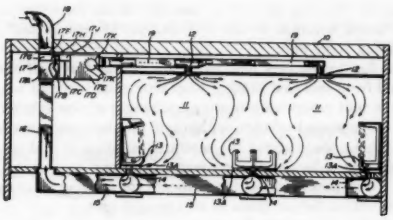
(g) means for selectively conveying coolant from the secondary coolant storage means and selectively mixing said coolant with the coolant being conveyed from the primary coolant storage means to the cooling means for the storage area.

4,519,217

SUPERMARKET ENVIRONMENTAL CONTROL SYSTEM

Parker V. Phillips, Brantford; Ness Lakdawala, St. Lambert, and Michel Lecompte, Mont St. Hilaire, all of Canada, assignors to Hussmann Corporation, Bridgeton, Mo.

Filed Jan. 4, 1983, Ser. No. 455,572
Int. Cl.[3] F25D *17/08;* A47F *3/04*
U.S. Cl. 62—256 **9 Claims**



1. An air temperature control apparatus for conditioning an enclosed space having at least one refrigerated display fixture having an open display zone separated from the conditioned space by at least one plane of refrigerated air that is substantially lower in temperature than the air temperature throughout the enclosed space and which imposes a continuous refrigeration effect thereon in the form of cooling the space air adjacent to said plane and inducing a downward flow of said

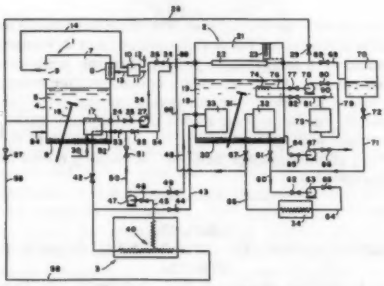
cooled space air adjacent to said refrigerated fixture, said apparatus comprising return air inlet means located under said refrigerated fixture for receiving said cooled space air, a housing having a return air chamber and a make-up air chamber isolated from each other, said return air chamber having an inlet in communication with said return air inlet means for being supplied with the air from the conditioned space that is cooled by said refrigeration effect, said make-up air chamber having an inlet being supplied by ambient air from outside said enclosed space, separate air treatment means in each of said chambers for separately conditioning the respective air flow therethrough, each of said chambers having an outlet connected to a mixing compartment for receiving and mixing the separately conditioned air from the respective return air and make-up air chambers and including air moving means for displacing said mixed conditioned air back into said enclosed space.

4,519,218

HEATING SYSTEM OPERATING ON STORED ENERGY

Avraham Melamed, and Zahal Harel, both of 31 Haoranim St., Kfar Shmariyahu 46 910, Israel

Filed Apr. 19, 1984, Ser. No. 602,008
Claims priority, application Israel, May 6, 1983, 68621
Int. Cl.³ F25D *23/00*
U.S. Cl. 62—271 **12 Claims**



1. A multi-stage heating system comprising:

a first upstream heating stage unit and a second downstream heating stage unit, each of said heating stage units being adapted to hold a saturated solution of a hygroscopic system, with an air space being disposed above the hygroscopic system in each unit;

means for blowing ambient air thorugh the air space above the saturated solution of the hygroscopic system in said first heating stage unit;

means for transferring heat by means of water as heat carrier fluid from said first heating stage unit to said second heating stage unit comprising heating exchanger means submerged in the saturated solution within said first unit, an evaporator in the air space above the saturated solution in said second unit, means for conducting water from said heat exchanger means to said evaporator and means for causing air convection within the air space in said second unit;

heat exchanger means disposed in said second heating stage unit and being linked in a heat carrying manner to at least one heat consumption device;

a source of sensible heat outside of said first and second heating stage units; and

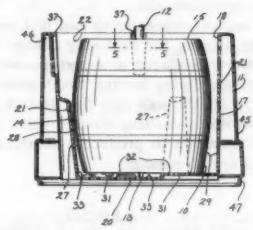
means for transferring sensible heat from said heat source to the respective hygroscopic systems in each of said heating stage units to cause evaporation of water from the respective solutions, thereby to regenerate the respective hygroscopic systems therein.

4,519,219

RECEPTACLE FOR BEVERAGE CONTAINER

Kay E. Prepodnik, Milwaukee; Peter A. Finn, Wauwatosa, and Daniel J. Manning, Thiensville, all of Wis., assignors to The Kelch Corp., Mequon, Wis.

Filed Aug. 15, 1983, Ser. No. 522,809
Int. Cl.³ F25D *3/06*
U.S. Cl. 62—457 **2 Claims**



1. A receptacle for holding a beer keg while the exterior of the keg is being subjected to an ice water bath, comprising:

a housing which is formed with a generally cup-shaped internal cavity, the cavity being defined by a bottom wall and cavity sidewalls;

the housing also being formed with an upper opening for allowing the keg and ice water to be inserted in and removed from the cavity;

a plurality of vertically extending centering ribs positioned in the cavity at circumferentially spaced locations around the radial periphery of the cavity;

said ribs having inner centering edges spaced radially inward from the cavity sidewalls;

side compartments which are bounded by adjacent ribs, the cavity sidewalls and upon insertion of the keg the keg outer side walls, and which are suitable for storing the ice water along the sides of the keg;

a platform positioned in the cavity and having an upper edge which is spaced upward from the cavity bottom wall, so that when the keg and ice water are inserted in the cavity and the keg is positioned on the upper edge, the upper edge can hold the keg up off the cavity bottom wall;

said platform being constructed so as not to cover a portion of the cavity bottom wall adjacent a central vertical axis of the cavity;

a bottom compartment adjacent the central vertical axis of the cavity which is bounded by the bottom wall of the cavity, the platform, and upon insertion of the keg the bottom of the keg, for storing ice water under the keg;

said side compartments being in direct communication with said bottom compartment when the keg has been positioned on the platform, whereby the ice water may readily pass therebetween once it is added to the cavity; and

a pocket formed in the upper end of a cavity side wall, said pocket being upwardly open, having a bottom closure, and having means defining pocket sides, whereby a support post may be mounted in said pocket and held by said pocket against other than substantially vertical movement.

2. A receptacle for holding a beer keg while the exterior of the keg is being subjected to an ice water bath, comprising:

a housing which is formed with a generally cup-shaped internal cavity, the cavity being defined by a bottom wall and cavity sidewalls;

the housing also being formed with an upper opening for allowing the keg and ice water to be inserted in and removed from the cavity;

an outer insulating housing tube being formed integrally with the internal cavity, said tube surrounding the cavity sidewalls, and being positioned relative thereto so as to leave a space between the inside of the tube and a portion

of the cavity sidewalls, said tube also extending below the bottom of the cavity bottom wall to form a pedestal support for the cavity;

a plurality of vertically extending centering ribs positioned in the cavity at circumferentially spaced locations around the radial periphery of the cavity;

said ribs having inner centering edges spaced radially inward from the cavity sidewalls;

side compartments which are bounded by adjacent ribs, the cavity sidewalls and upon insertion of the keg the keg outer side walls, and which are suitable for storing the ice water along the sides of the keg;

a platform positioned in the cavity and having an upper edge which is spaced upward from the cavity bottom wall, so that when the keg and ice water are inserted in the cavity and the keg is positioned on the upper edge, the upper edge can hold the keg up off the cavity bottom wall;

said platform being constructed so as not to cover a portion of the cavity bottom wall adjacent a central vertical axis of the cavity and to have a plurality of segments which radiate outwardly towards the cavity sidewalls;

a bottom compartment adjacent the central vertical axis of the cavity which is bounded by the bottom wall of the cavity, the platform, and upon insertion of the keg the bottom of the keg, for storing ice water under the keg;

said ribs and radiating platform segments being angularly offset from each other at a plurality of locations around the periphery of the cavity side walls; and

said housing being a one-piece unit made of molded thermoplastic, and being of substantially uniform thickness throughout.

4,519,220

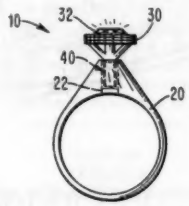
INTERCHANGEABLE JEWELRY HAVING SECURING MEANS

Lynn M. Burrell, 36 Harvard Ct., White Plains, N.Y. 10605

Filed Feb. 22, 1983, Ser. No. 468,071

Int. Cl.³ A44C *17/02*

U.S. Cl. 63—29 R **6 Claims**



1. An interchangeable wearable jewelry device comprising:

a base unit, said base unit having means for attachment of the device to a wearer and containing a receiving structure including a rigid outer member and a resilient non-metallic insert concealed and supported within said outer member, said receiving structure being provided with an essentially tapered threaded hole having a wider opening at one end thereof and tapering to a narrower opening at the opposite end; and

a feature unit being set with a straight untapered rigid threaded stem structure, its thread being of a size to substantially mate with the thread of said receiving structure at the end of said tapered hole, the thread of said receiving structure being formed on the inner surface of said hole substantially from the wider opening and continuing to the narrower opening and being of sufficient length to contain the thread of said stem structure;

said feature unit being adapted to be securely engaged to said receiving structure by manually grasping said units, threading said threaded stem structure through the wider opening of said tapered hole, and adjusting said threaded stem structure further into the narrower end of said tapered hole, thereby more frictionally engaging said receiving structure;

said feature unit being adapted to be disengaged from said base unit through said wider opening by manually grasping said units and adjusting said threaded stem structure away from the narrower end of said tapered hole,

whereby said feature unit can be mounted securely on said base unit, or disengaged from said base unit and selectively mounted securely on a different base unit having also such a receiving structure.

4,519,221

KNITTING MACHINE

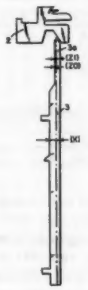
Hideo Hirano, Nara, Japan, assignor to Okamoto & Co., Ltd., Nara, Japan

Filed Sep. 8, 1983, Ser. No. 531,176

Claims priority, application Japan, Sep. 8, 1982, 57-157293; Jul. 13, 1983, 57-108566; Jul. 14, 1983, 58-129100

Int. Cl.³ D04B *15/C5, 9/12*

U.S. Cl. 66—107 **1 Claim**



1. A circular knitting machine designed to form patterns with sinkers, said knitting machine comprising:

a cylinder provided with vertical slits on its outer circumference;

a sinker mounted in the upper part of every other slit, each one of said sinkers, disposed radially from the axis of the cylinder, being formed on its bottom edge with a cutout having a slanted front edge of the sinker;

a sinker selector jack provided in the slit such that when said sinker selector jack moves up within said slit, said sinker selector jack pushes against said slanted front edge of said cutout of said sinker to move said sinker towards a center of said cylinder; and

knitting needles mounted in the slits of the cylinders, each of said needles being in a slit next to the slit wherein the sinker is mounted.

4,519,222

DEVICE FOR SMOOTHING GARMENTS

Martin Kannegiesser; Klaus Müssiger, both of Bad Salzuflen, and Wilfried Dreischmeier, Vlotho, all of Fed. Rep. of Germany, assignors to Herbert Kannegisser GmbH & Co., Vlotho, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,408

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1982, 3222199

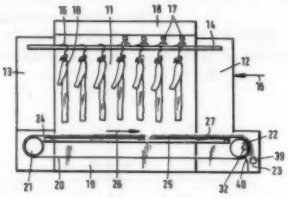
Int. Cl.³ D06B *3/30, 23/00*

U.S. Cl. 68—5 C **7 Claims**

1. A device for smoothing garments, in particular for the simultaneous drying and smoothing of washed garments, by means of flowing media, such as steam and hot air, said device comprising:

a treatment chamber (11),

a first chamber (12) connected to the front of the treatment chamber (11) and opening thereto,
a second chamber (13) connected to the rear of the treatment chamber (11) and opening thereto,
means for conveying garments horizontally through said treatment chamber from one of said first and second chambers to the other of said first and second chambers,
pipes (17) arranged in the rreatment chamber (11) above the garments (10) and having outlet nozzles for directing steam downwardly onto said garments,
hot air ducts (18) arranged in the treatment chamber (11) above the garments (10),
a media collecting chamber (19) arranged underneath the treatment chamber (11) for receiving the flowing media,
a filter arranged between the treatment chamber 911) and the media collecting chamber (19),
said filter constituting a sieve belt (20),
said sieve belt (20) extending over the full length and width of the treatment chamber (11) and over the full length of one of said first and second chambers,
reversing rolls (21, 22) operatively mounted for rotation



about their axes and positioned outside of the media collecting chamber (19),
said sieve belt (20) being conducted over the reversing rolls, such that a carrying run (24) of the sieve belt (20) acts to receive a carpet of fluff (27) during device operation,
means for pneumatically removing the carpet of fluff (27) from the sieve belt (20) outside of the media collection chamber (19),
said means for pneumatically removing said carpet of fluff (27) comprising compressed air nozzles (32) operatively positioned in the region where the sieve belt (20) is reversed, and
means for leading compressed air from the side of the sieve belt (20) opposite the fluff through said sieve the sieve belt (20) opposite the fluff through said sieve belt (20) to pneumatically remove the carpet of fluff (27) from the sieve belt (20), and
a receiving vessel (23) positioned outside of said one of said first and second chambers in proximity to the reversing roll (22) and functioning to collect the fluff pneumatically removed from the sieve belt (20) outside of the media collecting chamber (19).

4,519,223

WASHING MACHINE TUB CONSTRUCTION

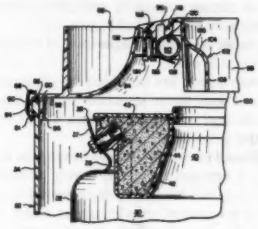
William A. Wasemann, Mansfield, Ohio, assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Division of Ser. No. 546,847, Oct. 31, 1984,. This application Oct. 12, 1984, Ser. No. 660,319

Int. Cl.³ D06F *39/08*

U.S. Cl. 68—23.5 **5 Claims**

1. A washing machine having an outer tub with an open top, a spin tub mounted inside said outer tub for rotation about a vertical axis and having an open upper end adjacent the outer tub open top, an annular top cap secured to said outer tub open top and extending radially inward to an inner peripheral wall radially inward of said spin tub open upper end, said top cap inner peripheral wall having a plurality of spray channels opening downwardly into said spin tub, each of said spray channels including a vertical wall portion, and a spray tube secured to said top cap on the bottom side thereof and extending around said top cap to each of said spray channels, said spray tube having a discharge opening adjacent each spray



channel positioned to spray water against said vertical wall for deflection into said spin tub.

4,519,224

CONTINUOUSLY-OPERATING MACHINE FOR THE TREATMENT OF ANIMAL HIDES AND SKINS

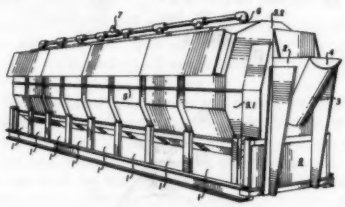
Dieter Seifert; Harald Müller, both of Forst; Lothar Müller, Freiberg; Karl Pestel, Karl-Marx-Stadt, and Helmut Geissler, Forst, all of German Democratic Rep., assignors to VEB Kombinat Textima, Karl-Marx-Stadt, German Democratic Rep.

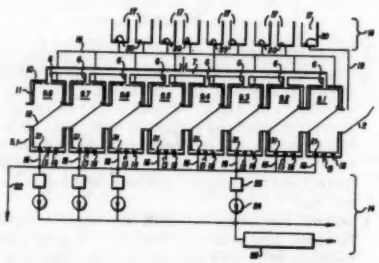
Filed Dec. 15, 1982, Ser. No. 449,932

Claims priority, application German Democratic Rep., Dec. 17, 1981, 235884

Int. Cl.³ C14C *1/00*

U.S. Cl. 69—30 **36 Claims**





1. A continuously-operating machine for the treatment of animal hides and skins comprising a drum, said drum being rotatably positioned around its longitudinal axis and being surrounded by a sealed shell, said drum having a circular loading opening at one end and a circular discharge opening on the oppisite end, said drum of the continuously-operating machine including a plurality of segments, all of which in turn comprise said drum, so that said drum is subdivided in said plurality of segments, said machine including a fluid separation

station, a delivery device, supply conduit system with inlet, discharge conduit system with dye discharge device, and heating apparatus with temperature regulation device, each of said segments being connected directly to said separation station via conduits, at least one segment of said drum being perforated, at least one further segment of said drum being unperforated, exhaust air conduits which exit in a centralized exhaust air pipe and which are arranged on said shell, and said separation station having dye cleaning devices and devices to restore the dye concentration.

4,519,225

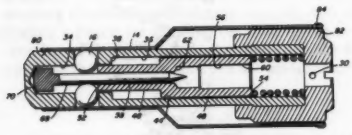
SLEEVE BARREL LOCK

Lawrence W. Simmler, Shrewsbury, and John H. Carlson, West Boylston, both of Mass., assignors to Omco Inc., Holden, Mass.

Filed Oct. 31, 1983, Ser. No. 547,407

Int. Cl.³ E05B *67/36*

U.S. Cl. 70—34 **19 Claims**



1. A high security lock comprising:

(a) a hollow cylindrical lock barrel having a closed front end and an apertured rear end, said lock barrel having an axially extending bore, the front bore having an relatively small diameter and the rear bore having a relatively large diameter;

(b) at least two radially extending passageways running from the exterior surface of said lock barrel to the front bore of said lock barrel;

(c) a locking member mounted in each said passageway for limited movement therein; and

(d) sleeve means mounted to said barrel, said sleeve means movable relative to said barrel between a locking member holding position and a locking member releasing position, said sleeve means contacting and restraining said locking members radially inward in said passageways when in said holding position, said sleeve means being out of contact with said locking members when in said releasing position.

4,519,226

PADLOCK

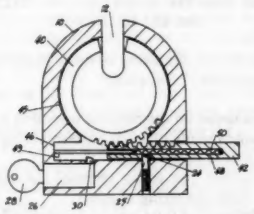
Robert J. Hadaway, 46 Buxton Rd., Wembley Downs, Australia 6019

Filed Aug. 13, 1982, Ser. No. 407,952

Claims priority, application Australia, Oct. 30, 1981, 76967/81

Int. Cl.³ E05B *67/28*

U.S. Cl. 70—48 **5 Claims**



1. A padlock comprising a padlock body having formed therein a slot arranged to receive an object to be secured, a hasp mounted in the body for movement between a first, inoperative position in which the slot can receive an object to be secured and a second, operative position in which it is disposed across the slot for securing a received object therein, said hasp being retained in said body in all phases of its operation and, when in the operative position, extending across the slot within the confines of the body whereby the portion of the hasp securing the object is shrouded, said hasp comprising a pinion having a toothed portion, said pinion being mounted for partial rotation within the body and being formed with a gap which, in the first inoperative position of the hasp, corresponds with the slot in the body, a toothed rack mounted for free linear movement in said body, the toothed portion of said pinion meshing with said rack whereby, upon linear movement of said rack, partial rotation of the pinion is effected to move the hasp reversibly between its first and second positions, said rack having a first position, corresponding to the first position of the hasp, spring means resiliently urging said rack outwardly of the body and to its first position, said rack having a second position, corresponding to the second position of the hasp, said rack being manually accessible exteriorly of said body for manual depression of the rack toward said body and into its second position against the action of the spring means, and locking means for locking the hasp in its second, operative position.

4,519,227

CONTROL LOCKING INSTALLATION FOR MOTOR VEHICLE DOORS

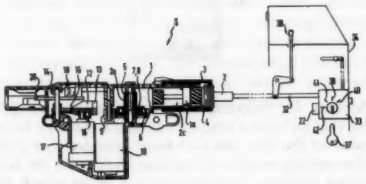
Gerhard Dumbser, Niederwerrn; Manfred Lutz; Rainer Fey, both of Schweinfurt, and Kurt Weiss, Schwebheim, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Mar. 23, 1983, Ser. No. 478,163

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210923

Int. Cl.³ E05B *65/36*

U.S. Cl. 70—264 **9 Claims**



1. Central locking installation for motor vehicle door locks or the like each having a locking element movable between a locking position, blocking said door lock and a position unlocking said door lock comprising:

(a) a first electric drive means for each locking element to be driven, which drives said locking element in a direction towards said locking position and a direction towards said unlocking position,

(b) a second electric drive means and for each locking element a blocking member movable by said second drive means in a blocking direction and a releasing directiion between a blocking position blocking said locking element in its locking position against manual unlocking and a releasing position releasing said locking element resp.,

(c) a drive current circuit having two current paths connected in parallel with one another, of which the first current path contains said first drive means connected in parallel with one another and the second current path contains said second drive means connected in parallel with one another,

(d) two controllable drive current switches connected to said drive current circuit, of which the first drive current

switch switches on said drive current circuit in said locking direction of said first drive means and said blocking direction of said second drive means and of which the second drive current switch switches on said drive current circuit in said unlocking direction of said first drive means and said releasing direction of the second drive means,

(e) at least one first control switch switchable between a first and a second switch position, at least one of said first control switches being actuatable by means of a key operating said door lock,

(f) a time control means connected with said drive current switches and said first control switch, said time control means switching on said drive current circuit in said first switch position of said first control switch for a predetermined time duration through said first drive current switch and in said second switch position of said first control switch for a predetermined time duratiion through said second drive current switch,

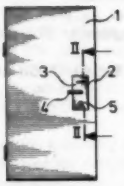
(g) at least one second control switch in series with said second current path containing said second drive means, said second control switch being actuatable by means of said key through said door lock which actuates the first control switch.

4,519,228

ELECTRONIC RECODEABLE LOCK

Tor Sornes, Moss, Norway, assignor to TrioVing A/S, Moss, Norway

Filed Mar. 24, 1982, Ser. No. 361,343
Claims priority, application Norway, Apr. 1, 1981, 811112
Int. Cl.³ E05B *47/00, 49/00*
U.S. Cl. 70—276 **3 Claims**



1. Method for recoding a lock of the type comprising a housing that includes a reading unit and a memory for recording codes for the lock, the lock being actuated by a preferably plate-formed key member containing a key code, the key member having thereon a recoding section on to which informations may be recorded and having a correct command for changing the code of the lock recorded on the recoding section, the method which comprises the steps of recoding said lock by inserting the key member into a slot in the lock, reading the key command for changing the code of the lock in said reading unit and storing the code of the inserted key member in said memory and removing the recording command from the key member upon removing the key member from the lock.

4,519,229

COMBINATION LOCK

Yaw-Kuen Yang, No. 190-30, Chang-Shui Rd., Tzu-Tung Li, Chang Hua City, Taiwan

Filed Feb. 22, 1983, Ser. No. 468,111
Int. Cl.³ E05B *37/12*
U.S. Cl. 70—312 **9 Claims**

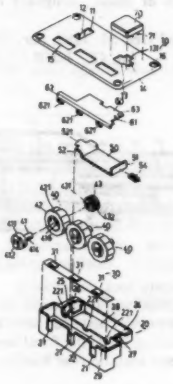
1. A combination lock comprising:

a casing;

dial wheel assemblies provided side by side in the front portion of said casing and biased upward to be exposed in part for manual operation; each of said dial wheel assemblies including an outer dial wheel, an axle member for mounting, and a collar member slidably sleeved onto said axle member and separably fitted to said dial wheel, said axle member of a first said wheel assembly being mounted in said casing separate from and parallel to said axle member of a second wheel assembly; each said axle member having an axial groove and each of said collar members having a radial bore, said radial bores being respectively registered with said axial grooves when said dial wheels are turned to a proper combination;

a bolt plate provided in the rear of said dial wheel assemblies and having an upwardly bent end;

means for biasing said bolt plate in the longitudinal direction to a latching position in contact with one side of said bent end;



a fence plate which is externally operated for movement to bring said bolt plate to a release position, provided longitudinally over said bolt plate and movable parallel relative to the longitudinal axis of said bolt plate, said fence plate having a first contact surface bearing against another side of said bent end, and having second contact surfaces bearing directly against the peripheral surfaces of said collar members so that it is locked against the movement in the direction opposite to the direction of said biasing means, said movement being permitted only when said dial wheel assemblies are turned to a proper combination of symbols.

4,519,230

APPARATUS FOR SIZING OF TUBES

Viktor N. Chachin; Vladimir K. Kolos; Viktor V. Botyan, all of Minsk, and Viktor M. Postnikov, Ivanovo, all of U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR, Minsk, U.S.S.R.

PCT No. PCT/SU82/00001, § 371 Date Sep. 30, 1983, § 102(e) Date Sep. 30, 1983, PCT Pub. No. WO83/02576, PCT Pub. Date Aug. 4, 1983
PCT Filed Feb. 2, 1982, Ser. No. 552,175
Int. Cl.³ B21D *26/02*
U.S. Cl. 72—56 **2 Claims**

1. An apparatus for the sizing of tubes under the pressure of a fluid, said apparatus comprising:

a bed;

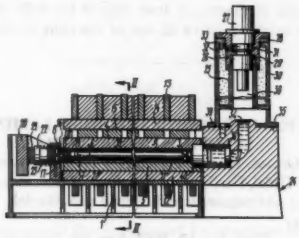
a split die mounted on the bed and provided with a horizontally arranged sizing channel corresponding to the desired shape of a tube to be sized;

a mandrel within the sizing channel for setting the tube coaxially with the sizing channel;

means for delivery of fluid into an hermetically sealed clearance between mandrel and the tube; and

means for building up the pressure of fluid between the mandrel and the tube positioned in the sizing channel

including an hydraulic striker unit having a working chamber filled with a fluid, a vertically arranged receiver with a barrel, a striking ram slidable within the barrel for building up the pressure of fluid in the working chamber



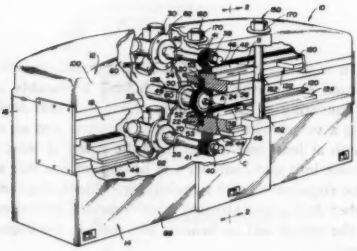
at impact with the fluid, and an adapter for connecting the working chamber to the sizing channel, said adapter including a piston for isolating the fluid filling the working chamber of the hydraulic striker unit from the fluid delivered into the clearance between the mandrel and the tube.

4,519,231

FORMING MACHINE INCLUDING DRIVE MECHANISM HAVING RACK AND GEAR SYNCHRONIZATION

Robert G. Roth, 17600 Collinson, East Detroit, Mich. 48021

Filed Mar. 11, 1983, Ser. No. 474,444
Int. Cl.³ B21D *17/00*
U.S. Cl. 72—88 **8 Claims**



1. In a forming machine including upper and lower bases (**12**, **14**), a connecting portion (**16**) extending between the upper and lower bases to cooperate therewith in defining a work space (**18**), said upper base having a front wall (**100**), said lower base having a front wall (**88**), and said machine having a rear wall (**60**) common to the upper and lower bases and connecting portion; an intermediate wall (**90**) spaced rearwardly from said front walls (**88**, **100**) and forwardly of said rear wall (**60**) defining the front vertical wall of said connecting portion; and upper and lower slides (**20**, **22**) respectively mounted on the upper and lower bases for rectilinear movement, the improvement comprising: said upper base (**12**) having a pair of vertically spaced, horizontal upper and lower walls (**116**, **117**) extending rearwardly from said front wall (**100**) above said work space; a pair of horizontally spaced vertical front and rear bosses (**118**, **119**) extending between the upper and lower walls (**116**, **117**) of the upper base (**12**); said lower base (**14**) having a pair of horizontal, vertically spaced, upper and lower walls (**108**, **110**) extending rearwardly from said front wall (**88**) beneath said work space; a pair of vertical, horizontally spaced front and rear bosses (**112**, **114**) extending between the upper and lower walls (**108**, **110**) of the lower base (**14**); said front and rear bosses (**118**, **119**) of said upper base (**12**) being in substantially co-planar relationship with the front and rear bosses (**112**, **114**), respectively, of the lower base (**14**); said intermediate wall (**90**) being spaced from said rear bosses (**114**) and (**119**) on the sides thereof opposite the front bosses (**112**, **118**) and extending between the lower wall (**117**) of the upper base (**12**) and the upper wall (**108**) of the lower base (**14**); aligned openings (**134**) in said rear and intermediate walls (**60**, **90**); a headstock (**128**) projecting into the work space (**18**) and having a tubular housing (**130**) supported in said openings (**132**, **134**); upper and lower slides (**20**, **22**) mounted respectively on the lower wall (**117**) of said upper base (**12**) and the upper wall (**108**) of said lower base (**14**); upper and lower synchronizing racks (**50**, **52**) mounted respectively on said upper and lower slides (**20**, **22**); a synchronizing gear (**48**) lying in a plane and rotatably mounted on said headstock housing (**130**) in meshed engagement with said synchronizing racks (**50**, **52**); and a pair of opposed, upper and lower forming racks (**24**, **26**) mounted respectively on said upper and lower slides (**20**, **22**) on the opposite side of said synchronizing racks (**50**, **52**) from said intermediate wall (**90**); whereby said slides and forming racks are rectilinearly moveable in opposite directions in synchronized relationship; upper and lower hydraulic motors (**30**, **32**) respectively mounted on the upper and lower bases operable to respectively move the upper and lower slides in opposite directions in parallel relationship to each other, said upper hydraulic motor having an output member (**38**, **192**) connected with said upper slide in the space enclosed by said front and rear bosses (**118**, **119**) and upper and lower walls (**116**, **117**) of said upper base and forwardly of the plane of said synchronizing gear (**48**); said lower hydraulic motor having an output member (**38**, **192**) connected with said lower slide in the space enclosed by said front and rear bosses (**112**, **114**) and upper and lower walls (**108**, **110**) of said lower base and forwardly of the plane of said synchronizing gear (**48**) so that said hydraulic motors apply forces on said slides to cause reciprocation thereof on the opposite side of said synchronizing gear from said intermediate wall; a pair of tie rod connections extending between the upper and lower bases to control deflection therebetween, each tie rod connection including a sleeve having opposite ends respectively engaged with the upper and lower bases, and each tie rod connection also having a tie rod extending through the sleeve thereof between the upper and lower bases and including a nut threaded thereto for compressing the sleeve and tensioning the tie rod in a preloaded manner to provide the prevention of deflection between the bases.

4,519,232

METHOD AND APPARATUS FOR NECKING CONTAINERS

Edward S. Traczyk, Lockport, and Michael M. Shulski, Northfield, both of Ill., assignors to National Can Corporation, Chicago, Ill.

Filed Dec. 27, 1982, Ser. No. 453,232
Int. Cl.³ B21B *39/02*
U.S. Cl. 72—133 **30 Claims**

9. Necking apparatus for necking open ends of metal containers comprising a support, a turret rotatable on said support and having a plurality of substantially identical necking stations spaced about and adjacent to the periphery thereof, each necking station including:

(a) an annular necking die on said turret;

(b) a knock-out punch reciprocable in said necking die;

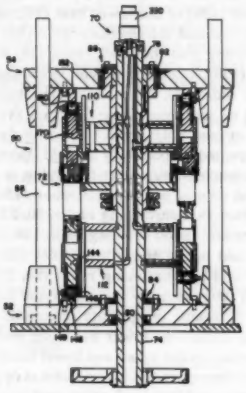
(c) means for reciprocating said punch in said necking die including a first cam follower;

(d) a platform spaced from and aligned with said necking die;

(e) means for moving said platform towards and away from said necking die including a second cam follower,

said support having a first cam engaged by all of said first cam followers and a second cam engaged by all of said second cam

followers and having at least one removable and replaceable segment to vary the extent of movement of said platform; and



pressurized pneumatic fluid means for maintaining said first cam followers in engagement with said first cam.

4,519,233

ROLL STAND WITH NONCYLINDRICAL ROLLS

Hugo Feldmann, Alsdorf; Friedrich Hollmann, Grevenbroich; Gerd Beisemann, Düsseldorf, and Horst Gärtner, Neuss, all of Fed. Rep. of Germany, assignors to SMS Schloemann-Siemag AG, Düsseldorf, Fed. Rep. of Germany

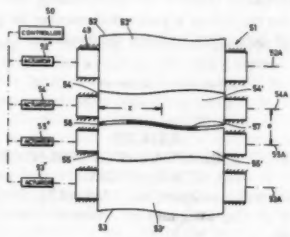
Filed Apr. 8, 1983, Ser. No. 483,372

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038865; Apr. 10, 1982, 3213496

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ B21B *31/18*

U.S. Cl. 72—247 **8 Claims**



1. A rolling stand comprising:

a housing defining a pair of parallel and spaced inner axes and a pair of parallel and spaced outer axes flanking the inner axes and defining therewith a plane;

respective inner rolls journaled in the housing at the inner axes and having bodies axially symmetrical about the respective axes and having centered on the respective axes roll-body surfaces of noncylindrical shape and each formed by rotation of a continuously curved generatrix about the respective axis, one of the inner rolls being displaceable axially relative to the other inner roll from an end position to another position, the inner-roll surfaces being spaced in the plane in the other position at a uniform distance and in the plane in the end position at a nonuniform distance;

respective outer rolls journaled in the housing at the outer axes and bearing toward each other on the respective inner rolls, the outer rolls having roll bodies axially symmetrical about the respective axes and having centered on the respective axes roll-body surfaces of noncylindrical shape complementary to that of the respective inner roll; and

means for displacing at least one of the rolls of one of the pairs axially relative to one of the rolls of the other pair.

4,519,234

DEVICE FOR MANUFACTURING LAMINATED SEMIFINISHED MATERIAL

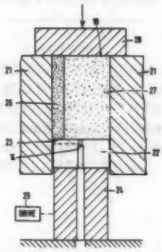
Joachim Grosse, Erlangen; Heinrich Hässler, Wendelstein, and Günter Tiefel, Fürth, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 12, 1983, Ser. No. 513,075

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1982, 3229626

Int. Cl.³ B21C *23/22*

U.S. Cl. 72—258 **10 Claims**



8. In a device for manufacturing by indirect extrusion a laminated semifinished material having a plurality of layers each consisting at least partially of a metal, said device comprising a vessel with a rectangular chamber and an extrusion die with at least one cutout, said die being at least partially insertable into said chamber and having on one side a contact surface engageable with a multilayered blank disposed in said chamber during an extrusion operation, said cutout extending from the side of said die bearing said surface, the improvement wherein:

the side of the die bearing the contact surface is provided at least partially with a profiled portion, bounded on one side by the die cutout, in such a manner that the different layers of the blank are developed with a predetermined thickness distribution over an extrusion cross section.

4,519,235

LOUVER TOOL

Donald A. Gauck, 24 Falcon La., Cincinnati, Ohio 45218

Filed Oct. 13, 1983, Ser. No. 541,465

Int. Cl.³ B21D *17/02*

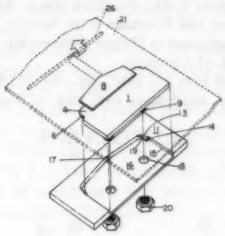
U.S. Cl. 72—414 **15 Claims**

1. A louver fabricating tool for forming louvers in a material wherein an operator only has access to one side of said material comprising:

(1) a shaper element; and

(2) a die element, said die element including a recessed area, said recessed area having side walls and projections, and an outwardly tapered apex wall; said shaper element including an abutting region designed to contact at least a portion of said recessed area, and including a shaper segment having recessed ledges at each end thereof and sized

to fit within the recessed area between the projections and apex said shaper element further including a tuck flap



attached to said shaper segment for insertion into an incision in the work material.

4,519,236

CLAMPING DEVICE TO BE MOUNTED ON A FRAME OR BENCH JIG FOR CHECKING ANY DEFORMATIONS OF A VEHICLE BODY

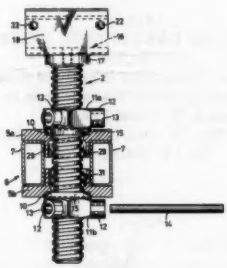
Germain Celette, Vienne, France, assignor to Celette, S.A., Vienne, France

Continuation of Ser. No. 404,920, Aug. 3, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,163

Claims priority, application France, Aug. 13, 1981, 81 15672

Int. Cl.³ B21D *1/12*

U.S. Cl. 72—457 **8 Claims**



1. A clamping device adapted to be mounted on a frame for clamping to the body of a vehicle supported on the frame, the clamping device comprising slide means adapted to be supported at one end from the frame upon which the body of the vehicle is supported for positioning a clamping device in a predetermined position relative to the vehicle body, said slide means including a pair of horizontally-extending parallelly-spaced slide members forming a slideway between the opposed faces thereof, a pair of bearing blocks one disposed on each upper and lower side of said slide members and positionable along said slideway, a vertical screw positioned within said slideway and being supported thereby by a pair of tightening nuts, said vertical screw having a clamping means supported from an upper end thereof for clamping to the body of a vehicle supported on the frame, said pair of tightening nuts being carried upon said vertical screw with one of said nuts positioned to bear against an upper portion of said bearing block disposed on the upper side of said slide members and the other of said nut positioned to bear against a lower portion of said bearing block disposed on the lower side of said slide members for moving said clamping means in a vertical direction.

4,519,237

OXYGEN-SENSING SYSTEM

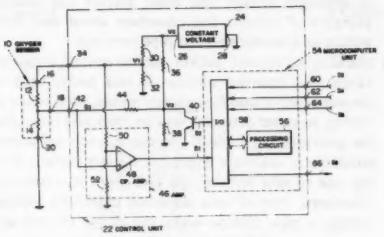
Hiromasa Kubo, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 26, 1983, Ser. No. 545,696

Claims priority, application Japan, Oct. 30, 1982, 57-189993

Int. Cl.³ G01N *27/12*

U.S. Cl. 73—23 **6 Claims**



1. An oxygen-sensing system comprising:

(a) a sensing element exposed to a gas to be analyzed for oxygen concentration, the sensing element having an internal electrical resistance which depends on its temperature and also on the oxygen concentration in the gas;

(b) a thermistor having an internal electrical resistance which depends on its temperature, the thermistor being positioned near the sensing element so that the temperature of the thermistor substantially coincides with the temperature of the sensing element, the ratio of the internal resistances of the thermistor and the sensing element being substantially independent of the temperature of the thermistor and the sensing element but being dependent on the oxygen concentration in the gas;

(c) first means for sensing the internal resistance of the thermistor and thereby determining the temperature of the sensing element;

(d) second means for sensing the ratio of the internal resistances of the thermistor and the sensing element and thereby determining the oxygen concentration in the gas;

(e) means, responsive to the first means, for generating a first signal indicative of the temperature of the sensing element;

(f) means for generating a second signal indicative of a predetermined reference level for the temperature of the sensing element;

(g) means, responsive to the first and second signals, for determining whether or not the temperature of the sensing element is lower than the reference level and generating a third signal indicative thereof; and

(h) means, responsive to the third signal, for enabling the first means and disabling the second means when the temperature of the sensing element is lower than the reference level, and for enabling the second means and disabling the first means when the temperature of the sensing element rises to the reference level.

4,519,238

APPARATUS FOR INTERNALLY TESTING A PLURALITY OF INTERCONNECTED PIPE SECTIONS

Charles D. Hailey, P.O. Box 26063, Oklahoma City, Okla. 73126

Filed Apr. 28, 1983, Ser. No. 489,591

Int. Cl.³ G01M *3/08*

U.S. Cl. 73—40.5 R **20 Claims**

1. A pipe testing apparatus suitable for simultaneously but separately testing the joint and wall portions of a plurality of interconnected pipe sections, comprising:

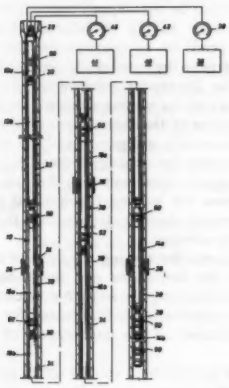
an elongated cylindrical body having an outer diameter smaller than the inner diameter of the pipe sections into

which said body is designed to be introduced for providing a radial clearance between said body and the inner surface of said pipe sections;

a plurality of first packer means spaced longitudinally along the external surface of said body, said first packer means when relaxed having outer diameters smaller than the diameter of said inner surface for providing said radial clearance, said first packer means sufficiently expandable to sealingly engage said inner surface for producing a plurality of annular test chambers about said body and within said interconnected pipe sections;

a plurality of second packer means spaced longitudinally along said external surface of said body, each spaced between two of said first packer means, each when relaxed having an outer diameter smaller than said inner diameter for providing said radial clearance, each sufficiently expandable to sealingly engage said inner surface for dividing one of said annular test chambers into two adjacent chambers, one of said adjacent chambers suitable for testing a pipe section wall, the other of said adjacent chambers suitable for testing a joint between pipe sections;

means for conducting a liquid through said body and into fluid communication with said first and second packer means and with a plurality of closed ports, each of said ports in fluid communication with the exterior of said body;



means for pressurizing said liquid to a first predetermined pressure at which said first packer means is expanded and set, means for pressurizing said liquid to a second and higher predetermined pressure at which said second packer means is expanded and set only while said first packer means are in sealing engagement, and means for pressurizing said liquid to a predetermined wall test pressure below which each of said ports is opened causing each of said chambers suitable for testing a pipe section wall to fill with said liquid at said predetermined wall test pressure;

means for conducting a gas through said body and through a plurality of ports in said body to the exterior of said body;

means for pressurizing said gas to a predetermined joint test pressure to fill each of said chambers suitable for testing a joint between pipe sections with said gas at said predetermined joint test pressure; and

means for detecting a decrease in said predetermined test pressures indicative of a loss of test fluid through a leak.

4,519,239

APPARATUS FOR DETERMINING THE FLOW SHEAR STRESS OF SUSPENSIONS IN PARTICULAR BLOOD

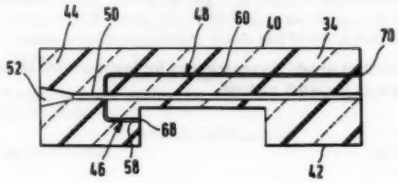
Holger Kiesewetter, Usch; Friedrich Jung, Aachen; Hartmut Radtke, Aachen, and Reinhard Witt, Aachen, all of Fed. Rep. of Germany, assignors to Holger Kiesewetter, Homburg-Kirrberg, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,594

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3218037

Int. Cl.³ G01N *11/04*

U.S. Cl. 73—55 **15 Claims**



1. Apparatus for determining the flow shear stress of suspensions, in particular blood, comprising a means having a main passage therein and a network of capillary passages, said capillary passages diverging from the main passage at an angle characterized by at least two capillary passages of which the ratio of the length L_l of the long passage and the length L_k of the short passage lies in a range of 3:1 to 15:1 and which are connected to a means for producing a variable pressure differential, and by a detector system with which the flowing of the fluid can be detected.

4,519,240

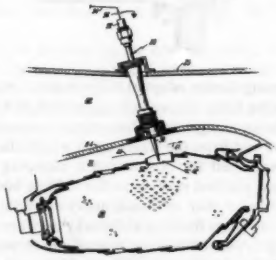
ELECTROSTATIC GAS TURBINE SURGE/STALL DETECTION

John W. St. Jacques, West Palm Beach, and Robert P. Couch, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 28, 1982, Ser. No. 454,121

Int. Cl.³ G01M *15/00*

U.S. Cl. 73—116 **7 Claims**



1. Electrostatic responsive apparatus for detecting electrostatic charge in a gas turbine engine having a compressor, a burner section including a burner can with air inlet ports through the walls thereof for allowing compressor outflow to enter said burner section, a compressor duct for conducting compressor outflow to and around said burner section, and a turbine disposed downstream of said burner section, comprising:

a pair of electrostatic probes, each of said probes disposed for response to electrostatic charge in gas within said compressor duct adjacent to said burner section, said

probes being arcuately separated from one another by a known significant portion of a semicircle in substantially the same lateral engine cross section;

bias means for providing a bias voltage separately to each of said probes; and

signal processing means connected for response to said probes, for providing a first probe signal in response to each occurrence of significant conductivity of the gas adjacent a first one of said probes, for providing a second probe signal in response to each occurrence of significant conductivity of the gas adjacent a second one of said probes, and for providing time signals indicative of the relative times at which said first probe signal and said second probe signal are provided.

4,519,241

AUTOMATIC GEAR TESTING APPARATUS

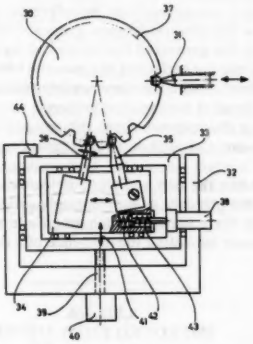
Willy Höfler, Fridtjof-Nansen-Strasse 35, D-7500 Karlsruhe 41, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,785

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1982, 3212078

Int. Cl.³ G01M *13/02*

U.S. Cl. 73—162 **15 Claims**



1. An automatic testing apparatus for testing the circumferential spacing of a gear rotationally driven in one rotational direction by a power source, comprising

an indexing means for indexing said gear from one measuring position to another,

a main slide displaceable on a frame,

a feeler means disposed on said main slide in the vicinity of a pitch circle of said gear,

means for measuring a deviation of a first tooth flank of at least one tooth gap and further means for measuring a second tooth flank during one insertion of said feeler means of the same tooth gap in the course of one gear revolution, including

means for automatic insertion of said feeler means into said measuring position and for the retraction therefrom via said main slide continuing from one tooth gap to the next for successive measuring positions,

a pickup means for providing a measurement value of respective tooth flanks relative to said at least one tooth gap before said gear is indexed to a successive measuring position, and

a control means responsive to said pickup means for transmitting said measurement value from said pickup means for further processing.

4,519,242

AUTOMATIC GEAR TESTING APPARATUS

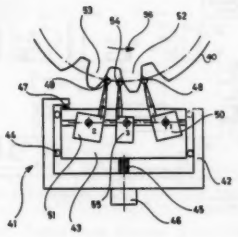
Willy Höfler, Fridtjof-Nansen-Strasse 35, D-7500 Karlsruhe 41, and Peter Golder, Ettlingen, both of Fed. Rep. of Germany, assignors to Willy Höfler, Karlsruhe, Fed. Rep. of Germany

Filed May 11, 1983, Ser. No. 493,531

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224980

Int. Cl.³ G01M *13/02*

U.S. Cl. 73—162 **8 Claims**



1. An automatic testing apparatus for testing the circumferential spacing of gear teeth of a gear caused to rotate continuously in one direction comprising,

a slide displaceably mounted on a frame,

a drive means for radially moving said slide toward and away from said gear between adjustable stops for a testing operation,

first and second measuring feelers pivotably supported on said slide and each having a transducer means for sensing a measurement position value,

means for placing said feelers in contact with identical tooth flanks of said gear teeth in the vicinity of a pitch circle of said gear under the influence of a spring force when said feelers have been inserted into tooth spaces of said gear teeth by said slide and for raising said feelers from said tooth flanks counter to said spring force after a testing operation has been performed,

switching means connected to said first measuring feeler for transmitting the measurement value measured by said second measuring feeler for a specified pivoted position of said first feeler,

control means responsive to said switching means for operating said drive means to retract said feelers away from said gear teeth and reinsert said feelers into said gear teeth, and

a third measuring feeler having a transducer means for sensing a measurement position value disposed on said slide and positioned in the vicinity of the pitch circle of said gear pointing toward a tooth flank located opposite one of said first and second measuring feelers, and said switching means transmitting the measurement value measured by said third feeler for a specified pivoted position of said first feeler.

4,519,243

APPARATUS FOR THE NONDESTRUCTIVE TESTING OF ELONGATED TEST SPECIMENS BY MAGNETIC TECHNIQUES

Wolfgang Trautmann, Reutlingen, Fed. Rep. of Germany, assignor to Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG., Reutlingen, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 473,952

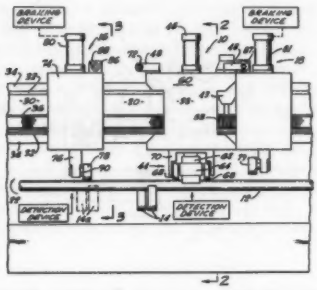
Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3209006

Int. Cl.³ G01M *19/00*; G01N *37/00*

U.S. Cl. 73—432 R **8 Claims**

1. Testing apparatus for elongated test specimens having an

essentially circular cross-section, said apparatus having rollers supporting a test specimen from below and at least one of which being driven for rotating the test specimen about its central longitudinal axis, a transducer system for non-destructive testing of the test specimen including a transducer arrangement, a guiding arrangement to which the transducer arrangement is suspended, the structure of said guiding arrangement presetting a course or testing track along the test specimen in its longitudinal direction, means for moving the transducer arrangement in its course, and vertical positionable means for



pressing the test specimens in its lowered condition onto the rollers, comprising:

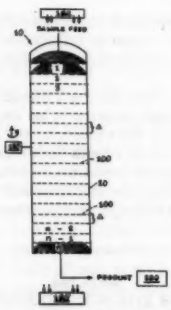
a plurality of pressing means arranged movably in a direction longitudinally of the test specimen, each said pressing means located immediately adjacent the guiding arrangement, at least one before and one behind the transducer system, and means for selectively and releasably coupling each of the pressing means to the transducer system such that the pressing means moves unitarily with the transducer system when so-coupled.

4,519,244

CASECADEOGRAPH AND METHOD OF USE

Thomas P. Meloy, 2202 Maple St., Morgantown, W. Va. 26505

Filed Jun. 21, 1983, Ser. No. 506,243
Int. Cl.³ G01N *15/00, 33/40, 33/00*
U.S. Cl. 73—432 R **54 Claims**



1. A method of separating and analyzing powders by virtue of their constituent particles having a pre-selected size range, comprising the steps of

(a) separating at least a portion of the particles having the pre-selected size range from the powder

(b) creating a sample from a number x of the separated particles

(c) passing the entire sample over a period of time through a number n of repetitive elements having a number y_1 *through n* openings, wherein the maximum value of x is less than the minimum value of y

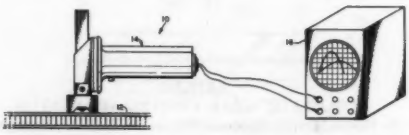
(d) determining the residence time, of the particles in the sample having similar shapes, during their passage through the n repetitive elements.

4,519,245

METHOD AND APPARATUS FOR THE NON-DESTRUCTIVE TESTING OF MATERIALS

Herbert M. Evans, R.D. #1, Box 231, Spring City, Pa. 19475

Filed Apr. 5, 1983, Ser. No. 482,149
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—579 **16 Claims**



1. A method for the nondestructive testing of materials comprising the steps:

a. impacting the surface of a reference sample of material known to be free of defects with a predetermined precisely regulated force of a variably controllable magnitude and duration;

b. sensing the response from the reference sample and generating a first electrical signal proportional thereto;

c. storing the generated first electrical signal;

d. impacting the surface of the material being tested at a first test location with the same predetermined, precisely regulated force as was applied in step a;

e. sensing the response from the material being tested and generating a second electrical signal proportional thereto; and

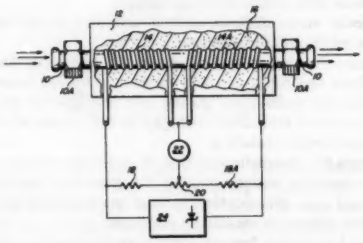
f. comparing the first and second electrical signals to determine the presence of an amplitude and/or frequency difference there between, such amplitude and/or frequency difference indicating the existence of a defect in the material.

4,519,246

IMPROVED FLOW METER

Gerrit A. Hartemink, Harderwijk, Netherlands, assignor to Advanced Semiconductor Materials International, N.V., Bilthoven, Netherlands

Filed Dec. 21, 1981, Ser. No. 332,557
Int. Cl.³ G01F *1/68*
U.S. Cl. 73—204 **17 Claims**



1. An improved flow meter comprising, in combination, sensor tube means for permitted flow of a fluid to be measured to be passed therethrough; fluid flow sensing means having electrical sensing resistance means operatively wound around said sensing tube to form two resistive sensing coils at adjacent

locations disposed along said sensor tube means for determining the fluid flow characteristics of a fluid flowing therein; the improvement comprising:

non-woven, polyester fiber insulation tape means wrapped tightly around said sensor tube means and said two resistance sensing coils for improved thermal insulation, for significantly reducing external thermal heat loss, for more securely holding said two resistive sensing coils against the outer surface of said sensor tube means, for greater physical strength, for preventing convection of air proximate said two resistive sensing coils thereby eliminating attitude sensitivity, for improved isolation from the surrounding temperature ambient, and for increasing the sensitivity of said electrical sensing resistance means; and

metallic thermal shield means having a high thermal conductivity and operably disposed concentrically around said insulation tape means for providing a homogeneous temperature distribution at the outer surface of said insulation tape means and in proximate contact with said non-woven polyester fiber insulation tape means for providing a homogeneous temperature distribution at the outer surface of said insulation tape means for substantially eliminating disturbances caused by radiation and conduction which can effect the accuracy of the sensor output in a non-symmetrical manner, said non-woven, polyester fiber insulation tape means further including solid plastic microspheres dispersed throughout said non-woven polyester fiber insulation for increasing thermal isolation from the surrounding temperature ambient and between adjacent resistive sensing coil windings, for increasing the strength and flexural support thereof, and for further lowering the thermal conductivity of said insulation tape means.

4,519,247

PROCEDURE FOR LUBRICATING THE BEARINGS IN EQUIPMENT COMPRISING A PLURALITY OF OIL-LUBRICATED BEARINGS

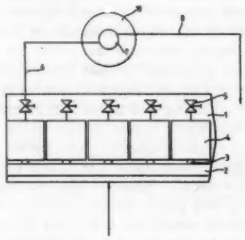
Kalevi Horttonen, Nurmijärvi, Finland, assignor to O. Kytölä ja Kumpp. Kommandiittiyhtiö , Muurame, Finland

Filed Jul. 18, 1983, Ser. No. 515,035

Claims priority, application Finland, Jul. 28, 1982, 822642

Int. Cl.³ G01F *15/18*

U.S. Cl. 73—198 **2 Claims**



1. A method for lubricating the bearings in equipment having a plurality of lubricated bearings, comprising:

locating a distribution header comprising, on a common frame,

(i) a plurality of volumetric meters,

(ii) a common supply conduit,

(iii) branch conduits connecting the supply conduit to the individual volumetric meters, and

(iv) valved outlets leading from the individual volumetric meters, adjacent selected ones of the bearings to be lubricated;

connecting the valved outlets from the individual volumetric meters, through connecting conduits, respectively to individual bearings of those selected;

supplying lubricant to the common supply conduit, thereby to distribute the lubricant to the selected bearings through the individual volumetric meters and valved outlets respectively associated therewith;

generating electrical signals respectively proportional to the lubricant flow passing through each of the volumetric meters;

transferring those electrical signals to a convenient monitoring point whose location is independent of the location of the distribution header and its plurality of volumetric meters; and

controlling the quantity of lubricant distributed to the individual bearings in response to the signals at the monitoring point.

4,519,248

DEVICE FOR MEASURING A WHOLE DAY URINARY OUTPUT

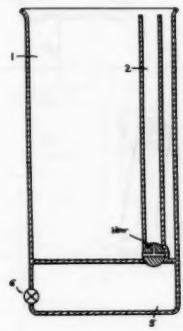
Yoshihiko Torii, Tokyo, and Osamu Tochikubo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Vine, Tokyo, Japan

Continuation of Ser. No. 317,387, Nov. 2, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,225

Claims priority, application Japan, Nov. 13, 1980, 55-158868; Oct. 15, 1981, 56-163394

Int. Cl.³ G01N *1/18*; G01F *5/00*; A61B *5/00*

U.S. Cl. 73—223 **1 Claim**



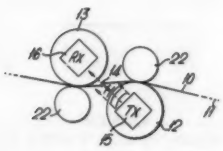
1. A device for measuring a whole day urinary output comprising an outer, flat-bottomed cylindrical container, an inner uncovered hollow tubular container positioned in said outer cylindrical container for sampling urine from the outer cylindrical container, and a reservoir positioned under the outer cylindrical container, characterized in that the hollow tubular container is vertically integrally fixed to the flat bottom surface of the outer container near the inner wall thereof and has a substantially constant cross-sectional area ratio with respect to the outer cylindrical container at any vertical location thereof, and that a single, two-way cock having an operating shaft operable from outside the device is provided to open communication between the two containers while closing communication between the inner container and the reservoir when said cock is in one position and to close communication between the two containers while opening communiction between the inner container and the reservoir when said cock is in a second position, said operating shaft being provided with a vent for effecting communication between the reservoir and the exterior of the device when said cock is in said second position.

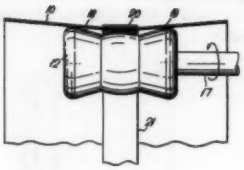
4,519,249

APPARATUS FOR DETECTING THE CONDITION OF A SHEET OR WEB

Steven A. Hunt, Petersfield, England, assignor to De la Rue Systems Limited, London, England

Filed Jun. 27, 1983, Ser. No. 508,188
Claims priority, application United Kingdom, Jun. 28, 1982, 8218618
Int. Cl.³ G01N 29/04
U.S. Cl. 73—596 10 Claims





1. In apparatus for detecting defects in webs or sheets, and having means defining a flow path for the web or for the sheets to be inspected, the combination of:

an ultrasonic transmitter arranged to direct ultrasonic energy towards the flow path in an inspection area;

an ultrasonic receiver directed to receive ultrasonic energy from the inspection area;

and signal analysing means (FIG. 7) responsive to the output of the receiver;

the transmitter directing the ultrasonic energy towards the inspection area as a continuous wave and the signal analysing means providing an output signal in response to changes in the output of the receiver during the passage of the web or sheet indicative of a defect in the inspected web or sheet;

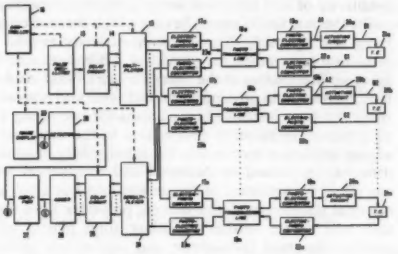
and wherein the receiver includes means defining in the inspection area a flow path which is convex in the longitudinal direction of the flow path, whereby the sheet or web is caused to assume a convex bend in the area in which the ultrasonic energy impinges upon it.

4,519,250

ULTRASONIC DIAGNOSIS APPARATUS USING REDUCED NUMBERS OF PHOTO TRANSMISSION LINES

Yoichi Sumino, Otawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 250,201, Apr. 2, 1981, abandoned. This application Jul. 22, 1983, Ser. No. 516,254
Claims priority, application Japan, May 8, 1980, 55-59942
Int. Cl.³ G01N 29/00
U.S. Cl. 73—626 4 Claims



1. An ultrasonic diagnosis appararus comprising:

an ultrasonic probe including N number of transducer elements actuated by electric pulses for emitting ultrasonic pulses, for receiving echo ultrasonic pulses, and for issuing electric pulses corresponding to said echo pulses;

a pre-programmed controller for designating the sequence of actuation of said transducer elements;

means for generating electronic pulses for actuating said transducer elements;

means for processing said electronic pulses corresponding to said echo pulses;

a signal transmission line including M number of photo transmission line for conveying photo pulses, said line interconnecting said generating means and said probe and interconnecting said probe and said processing means;

first electric-photo means in said generating means for converting said generated electric pulses to photo pulses for conveyance on said signal transmission line to said probe;

first photo-electric means in said probe for converting said photopulses generated by said first electric-photo means and conveyed by said signal transmission line to electric pulses for actuating said transducer elements;

second electric-photo means in said probe for converting said issued electric pulses to photo pulses for conveyance on said signal transmission line to said processing means;

second photo-electric means in said processing means for converting said photo pulses generated by said second electric-photo means and conveyed by said signal transmission line to electric pulses for feeding said processing means; and

M number of multiplexers in said ultrasonic probe, each said multiplexer having L number of taps which are interconnected with L number of transducer elements, the number N being equal to M multiplied by L, for actuating N number of said transducer elements M number at a time for each electric pulse generated by said generating means and for receiving from said transducer elements and forwarding to said processing means said issued electric pulses corresponding to said echo pulses, said multiplexers being controlled by said pre-programmed controller to actuate said transducer elements in a predetermined sequence and to distribute said issued electric pulses from said transducer elements to said second electric-photo means in said probe for conversion to photo pulses and transmission to said processing means on the appropriate photo transmission lines within said signal transmission

line, each said multiplexer being interconnected with a single photo transmission line so that the photo pulses from said generating means to a transducer element and from the same transducer element to said processing means are transmitted by the same photo transmission line.

4,519,251
ROLLER-TYPE ULTRASONIC INSPECTION DEVICE WITH ACOUSTICAL ISOLATION

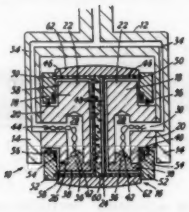
John K. Dickson, Waddesdon, England, assignor to Schlumberger Electronics (UK) Limited, Farnborough, England

Filed Sep. 6, 1983, Ser. No. 529,812

Claims priority, application United Kingdom, Sep. 15, 1982, 8226283

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—639 **9 Claims**



1. A roller-type ultrasonic inspection device for use in the ultrasonic inspection of an object, the device comprising:

a support having two spaced-apart generally parallel limbs;

two substantially coaxially aligned hub members each projecting from a respective one of the limbs towards the other hub member, the adjacent ends of the hub members defining a gap therebetween;

an acoustic isolation member disposed in said gap;

a respective ultrasonic transducer mounted in each hub member, one for use as an ultrasonic transmitter and the other as an ultrasonic receiver, each transducer being arrangd such that its principal transmitting/receiving axis extends generally radially of the hub members, both axes being in substantially the same plane, and such that said plane also contains the axis of alignment of the hub members; and

roller means rotatably mounted on said hub members, said roller means being adapted to make rolling contact with said object and to conduct ultrasonic signals from said one transducer to the object and from the object to said other transducer, wherein coupling between each transducer and said roller means is by means of a fluid surrounding each hub and the fluid associated with each hub is acoustically separated by said acoustic isolation member.

4,519,252
PRESSURE AND TEMPERATURE COMPENSATED PHOTOELASTIC HYDROPHONE

Donald H. McMahon, Carlisle, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Mar. 21, 1983, Ser. No. 476,957

Int. Cl.³ H04R *23/00*; G01L *1/24*

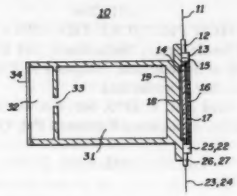
U.S. Cl. 73—655 **17 Claims**

1. An apparatus for sensing acoustic signals of the type comprising input and output optical fibers and polarizers in cooperation with an element having pressure sensitive birefringent properties further comprising:

housing means having a fluid filled acoustic chamber wherein said polarizers and birefringent element are positioned;

diaphragm means sealing one end of said acoustic chamber for transferring pressure variations caused by incident acoustic signals to said birefringent element and positioned a predetermined distance from one side of said birefringent element with said fluid therebetween, thereby establishing a first fluid filled space;

means fixed to said housing for supporting said birefringent element, and positioned a preselected distance from a side of said birefringent element opposite said one side to form



a second space, said second space having said fluid therein, whereby slow variations in ambient pressure and temperature cause said first and second spaces and said fluids therein to vary, thereby substantially relieving substantially static surface stresses in said birefringent element, while rapid pressure fluctuations are transferred therethrough substantially undiminished.

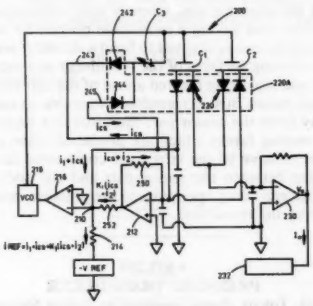
4,519,253
REACTANCE MEASUREMENT CIRCUIT WITH ENHANCED LINEARITY

Roger L. Frick, Eden Prairie, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.

Filed Apr. 29, 1983, Ser. No. 489,856

Int. Cl.³ G01L *9/12*

U.S. Cl. 73—718 **17 Claims**



1. A circuit for measuring a variable reactance means having at least two reactances, at least one of which varies responsive to a condition being sensed, the circuit providing an output signal representative of the sensed condition which has certain non-linearities with respect to the condition being sensed, the circuit comprising:

oscillator means coupled to the reactance means for providing a time varying oscillator signal to the variable reactance means;

rectification means coupled to the reactance means for providing separate charging signals to and separate discharging signals from each of the reactances comprising the reactance means, the charging and discharging signals being a function of the reactances of the reactance means; and

control means coupled to the rectification means and to the oscillator means for providing an input control signal to the oscillator means; and

means for selectively amplifying at least one of the charging and discharging signals to adjust the input control signal

from the control means and then to adjust the oscillator signal as a function of the selected amplified signal to substantially compensate for non-linearities of the output signal with respect to the condition being sensed to achieve a predetermined relationship between the output signal and the sensed condition.

4,519,254

HIGH PRESSURE TRANSDUCER

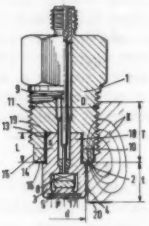
Hans-Conrad Sonderegger, Neftenbach, and Eugen Lutz, Winterthur, both of Switzerland, assignors to Kistler Instrumente A.G., Winterthur, Switzerland

Filed Apr. 4, 1983, Ser. No. 481,880

Claims priority, application European Pat. Off., Apr. 6, 1982, 82102930.3

Int. Cl.³ G01L *9/08, 23/10*

U.S. Cl. 73—726 **15 Claims**



1. A high pressure transducer having an externally threaded portion and operable to be threadably secured in a mounting aperture having an internally threaded portion and provided in a structural component, comprising a body member provided with said threaded portion, a sensor part connected with the body member and having a membrane portion for actuating a sensor element, means adapted to form a shoulder seal between mutually abutting surfaces of the transducer and the mounting aperture, said seal being located ahead of the threaded portion, and further means in said transducer operable to substantially keep away from the sensor part the force flux lines stemming from the sealing forces which are produced when sealing the transducer relative to the structural component including an annular gap between the sensor part and the body member, said annular gap being open toward the pressure medium to be measured by the transducer.

4,519,255

PRESSURE TRANSDUCER

Akira Ishii, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 6, 1983, Ser. No. 482,446

Claims priority, application Japan, Apr. 16, 1982, 57-62492

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—727 **8 Claims**

1. A pressure transducer, comprising:

a body having a recess on one side which is defined by a curved surface portion; and

a semiconductor pressure-sensitive element mounted on one side of the body and adapted to show a resistive value when a pressure applies thereon, said semiconductor pressure-sensitive element including a deformable portion adapted to be displaced in the recess due to the pressure value to produce internal stress, and a plurality of resistive layers which show resistive values corresponding to the internal stress,

the curved surface portion being brought into face contact with the deformable portion to prevent further deformation of the deformable portion when the deformable portion is displaced due to a pressure value greater than a pressure value within a measuring range, but smaller than a pressure value corresponding to an elastic limit of the deformable portion wherein said semiconductor pressure-sensitive element includes a cylindrical depression which is opened on said one side of said body; and wherein said body includes a disc-like base on which said semiconductor pressure-sensitive element is mounted, and a restricting member placed on the base, fitted in the cylindrical depression and having said recess defined by said curved surface portion.

4,519,256

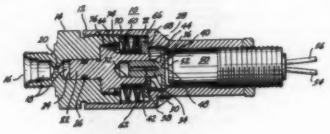
PRESSURE TRANSDUCER INCLUDING A PROXIMITY SENSOR

Ted M. Daniels, Edmonds, Wash., assignor to Eldec Corporation, Lynnwood, Wash.

Filed Mar. 14, 1983, Ser. No. 475,309

Int. Cl.³ G01L *7/16, 9/10*

U.S. Cl. 73—745 **15 Claims**



1. Apparatus for activating electrical switching means in response to a predetermined applied fluid pressure level comprising:

a housing having a provided bore and an inlet port for introducing fluid under pressure into said bore;

a piston disposed within the housing and being slidable within said bore, the piston having first and second ends, the first end having a face portion with an effective area for reacting with the fluid under pressure;

target means having a piston portion and a target portion, said piston portion having a mating relationship with the second end of said piston such that the piston and target means move as a unit;

switching means mounted to said housing and positioned to be activated by said target means target portion in response to a predetermined displacement of said piston and target means unit resulting from a predetermined applied fluid pressure level;

spring means providing a reaction force to said piston means for resisting displacement of said piston in response to applied fluid pressure, said spring means exhibiting a wear characteristic such that said reaction force varies with spring means wear in a predetermined manner; and

compensating means compensating said apparatus for said predetermined spring means wear characteristic such that said switching means is activated by said target portion at said predetermined fluid pressure level substantially independent of said wear characteristic.

4,519,257

ELECTRONIC FLOW METER FOR MEASURING FLOW OF BULK SOLIDS PNEUMATICALLY CONVEYED THROUGH A HOSE

Otto K. Simpkins, 4308 Glen Eden Dr., Nashville, Tenn. 37205

Filed Jul. 26, 1983, Ser. No. 517,456

Int. Cl.³ G01F *1/74*

U.S. Cl. 73—861.04 **6 Claims**

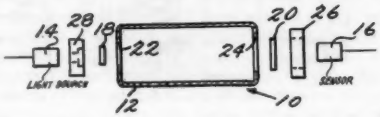
1. Apparatus for measuring the flow of bulk solids pneumatically conveyed through a hose comprising:

a detector including a light source and a light responsive sensing device arranged to receive a beam of light from said source, the detector being joined to the hose in such a manner that the solids pass through said light beam to

vary the intensity of light impinging on said sensing device thereby changing the output voltage of said device;

means for sampling and digitizing said output voltage;

a memory for accumulating digitized data produced by said sampling and digitizing means, said memory also storing a



constant representative of the type of solids conveyed through the hose; and

means for computing the weight of solids passing said detector by dividing the accumulated digital data by said constant.

4,519,258

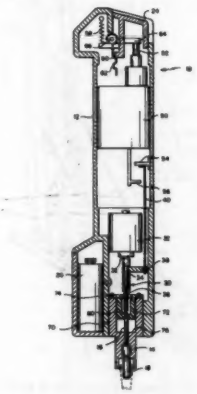
MOTORIZED PIPETTE

Raymond F. Jakubowicz, Rush, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 11, 1983, Ser. No. 540,974

Int. Cl.³ B01L *3/02*; G01N *1/14*

U.S. Cl. 73—864.16 **3 Claims**



1. In a pipette comprising a pressure chamber, a piston for generating pressure within the chamber, and means for moving said piston between a withdrawn position and an extended position providing predetermined maximum liquid ejection, said means including (i) a motor susceptible to overtravel when activating power to the motor is terminated, (ii) drive means coupling said motor to said piston to move said piston between said withdrawn position and said extending position, (iii) means for alternately connecting and disconnecting said motor to and from a source of such activating power, and (iv) means for reversing said motor;

the improvement wherein said pipette further includes drive-decoupling means for decoupling the drive of said piston from that of said drive means when said piston arrives at either one of said two positions from the other position,

whereby overtravel of said motor does not cause said piston to overtravel,

said drive-decoupling means comprising

(a) a shuttle secured to said piston and mounted for linear movement within said pipette from a first position corresponding to one of said positions of said piston, to a final position corresponding to the other of said piston positions,

(b) a resilient member integral with said shuttle and secured to said drive means to transmit driving force from said drive means to said shuttle when the latter is between said first and said final positions,

said resilient member further comprising a bistable mechanical flip-flop that is integral with said shuttle and is secured to said drive means, said flip-flop occupying either a position distal to or proximal to said piston, depending upon whether said shuttle has last reached said final position or said first position, respectively,

and stop means for limiting the travel of said shuttle to only points between said first and said final positions,

said flip-flop having a resiliency sufficient, when said shuttle strikes said stop means, to allow said motor to overtravel while said shuttle remains motionless.

4,519,259

VORTEX SHEDDING FLUID FLOWMETER

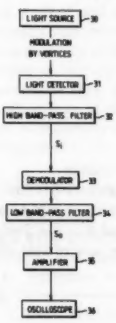
Gillies D. Pitt, Saffron Walden; Roger J. Williamson, Harlow; David N. Batchelder, London, all of England, and Arulanandam M. Prabakaran, Ayanavaram Madras, India, assignors to International Telephone & Telegraph Corp., New York, N.Y.

Filed Feb. 28, 1983, Ser. No. 470,662

Claims priority, application United Kingdom, Mar. 2, 1982, 8206032

Int. Cl.³ G01F *1/32*

U.S. Cl. 73—861.22 **8 Claims**

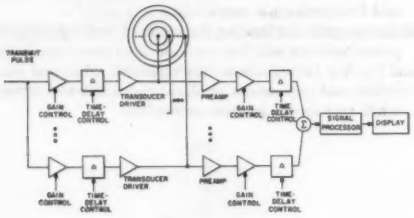


1. A method of monitoring the vortex shedding frequency from which a fluid flow rate or a parameter dependent thereon may be calculated, the method comprising: modulating an optical beam in dependence on the alternate high and low velocity regions comprising the vortex street, detecting the modulated beam, filtering the detector output by means of a first band-pass filter having a center frequency f_c, adjusting the pass-band of said filter in accordance with variations in the optimum value of frequency f_c, the first filter output comprising an amplitude modulated signal of frequency f_c modulated by the vortex shedding frequency, demodulating the first filter output and filtering the demodulated output by means of a second band-pass filter, the frequency of the second filter output comprising the vortex shedding frequency.

4,519,260
ULTRASONIC TRANSDUCERS AND APPLICATIONS THEREOF

Chong-Cheng Fu, Stanford, and Levy Gerzberg, Palo Alto, both of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Division of Ser. No. 350,020, Feb. 18, 1982, Pat. No. 4,431,936.
This application Jan. 26, 1984, Ser. No. 574,065
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.25 **2 Claims**



1. In a transducer structure comprising a plurality of concentric annular transducer elements, a method of energizing said transducer elements and transmitting an ultrasonic beam for use in volume flow measurements with independent amplitude and timing to achieve a Fourier-Bessel approximation, said method comprising the step of amplitude weighting each transducer element in accordance with the equation

$$S_n = b^2 a_n (a_n - a_{n+1})$$

where $a_1, a_2, \ldots, a_n$ is the amplitude of driving signals applied to said elements,

$r_1, r_2 \ldots, r_N$ are the radii of the elements from the center outward,

N is the number of elements,

$\alpha_1, \alpha_2, \ldots, \alpha_N$ are positive zeroes of the Bessel function $J_1(x)$,

$b = rn/\alpha n$, and

$$S_n = \frac{2}{J_2^2(\alpha_n)} \int_0^1 t\, g_o(t) J_1(\alpha_n t) dt$$

where

t is the integration variable

$g_o(.)$ is defined by $g_o(v) = v \cdot f_o(v/b)$

$f_o(u)$ is a desired pattern of said beam, where

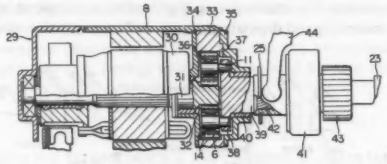
u is $(2\pi/\lambda) \sin \theta$, and θ is the field direction of said beam with respect to the axis of said elements.

4,519,261
STARTING MOTOR WITH PLANETARY GEAR REDUCTION GEARS

Isao Hamano, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 29, 1982, Ser. No. 437,612
Claims priority, application Japan, Nov. 17, 1981, 56-171493[U]
Int. Cl.³ F02N *15/00*; F16H *3/44*
U.S. Cl. 74—7 E **1 Claim**

1. A starting motor with planetary gear reduction gears comprising a spur gear provided at a front end of a rotational shaft of said starting motor, a ring shaped gear having internal gear teeth fixed to a front end of a yoke of said motor, a planetary gear for engaging said spur gear with said ring shaped gear, an output rotational shaft for transmitting the rotary force of said motor through said planetary gear, and a pair of

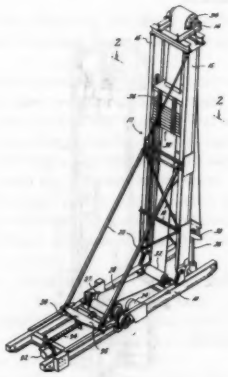


collars integral with said ring shaped gear and both ends of the internal teeth of said ring shaped gear.

4,519,262
POSITIVE ENGAGEMENT SAFETY MECHANISM AND LIFT BELT CONSTRUCTION FOR LONG STROKE, WELL PUMPING UNIT

Tam D. Le, and Weems D. Turner, both of Houston, Tex., assignors to Baker Oil Tools, Inc., Houston, Tex.

Filed Apr. 29, 1983, Ser. No. 489,728
Int. Cl.³ B66B *5/26*
U.S. Cl. 74—89.2 **7 Claims**



1. A long stroke, well pumping unit for a well pump including a conventional polish rod, rod string and sucker rod comprising: a base platform and a tower mounted on the base platform; rotatable drum means on the base platform and power means for rotating the drum means; a flexible lift belt attached at one end to the drum means and at its other end to the upper end of the polish rod of a well pump; a freely rotatable spool atop the tower over which the lift belt is trained; a counterweight carried by the lift belt; means for reversing the power means thereby to provide reciprocating movement to the lift belt and thus the polish rod, and positive engagement safety means for arresting and locking the counterweight against free fall in the event of failure by fracture of the lift belt, polish rod, rod string or sucker rod comprising: a cross bar securely fastened to the upper end of that portion of the lift belt beneath the counterweight; guide means dependent from the counterweight and arranged to receive said cross bar and permit only limited movement thereof longitudinally in the plane of the lift belt; means mounted within said guide means for exerting a predetermined counter force on said cross bar in opposition to tension on said lower portion of the lift belt; a pair of racks mounted within the tower one on either side in the plane of the lift belt; latch means mounted to said guide means adjacent to each of said racks in opposing relationship for movement into and out of engagement therewith; means

arranged in said guide means and responsive to movement of the cross bar longitudinally in the plane of the lift belt to move said latch means out of engagement with said racks when tension on the lift belt overcomes the predetermined counter force and for moving said latch means into engagement with said racks when tension on said lower porton of the lift belt is reduced below the level of the predetermined counter force, the predetermined counter force being selected so as to permit disengagement of the latch means from the racks under belt tensions corresponding to the normal operating loads of the pumping unit; whereupon failure by fracture of one of the well components or that portion of the lift belt between the polish rod and the spool, reduces belt tension below the level of the counter force in that portion of the lift belt beneath the counterweight thereby to allow said counter force exerting means to displace the cross bar longitudinally in the plane of the lift belt and cause said latch engagement means to move said latch means into engagement with said racks, thus to arrest and lock the counterweight against free fall.

4,519,263

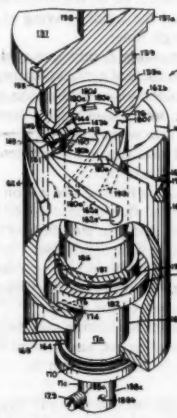
MATRIX SWITCHING CONTROL OF SUBSEA PRODUCTION SYSTEMS

Lionel J. Milberger, Spring, Tex., assignor to FMC Corporation, Chicago, Ill.

Division of Ser. No. 271,728, Jun. 8, 1981, abandoned, which is a division of Ser. No. 101,993, Dec. 7, 1979, Pat. No. 4,356,841. This application Sep. 13, 1982. Ser. No. 417,244

Int. Cl.³ F16H *27/02, 31/00*

U.S. Cl. 74—128 **6 Claims**



1. A bidirectional rotary actuator for providing successive increments of rotary motion of a shaft in a first direction and for reversing the direction of rotation and providing successive increments of rotary motion of the shaft in a second direction, said actuator comprising:

a pair of concentric cam members, each of said cam members having a plurality of cam slots therein;

means for coupling each of said cam members to said shaft;

a plunger;

means for mounting said plunger for axial movement relative to said shaft and for preventing rotary movement of said plunger;

a cam follower having first and second cam surfaces;

means for mounting said cam follower on said plunger and for arranging said cam slots in a first cam member to produce one increment of rotation of said shaft in a first direction when said first cam surface cooperates with cam slots in said first cam member as said plunger is moved in a first axial direction a distance greater than the length of one of said cam slots in said first cam member;

means for arranging said cam slots in a second cam member to produce one increment of rotation of said shaft in a second direction when said second cam surface cooperates with cam slots in said second cam member as said plunger is moved in a first axial direction a distance greater than the length of one of said cam slots in said second cam member;

means for preventing rotation of said shaft when said plunger is moved in a second axial direction.

4,519,264

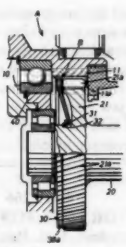
GEAR ASSEMBLY FOR ELIMINATING KNOCKING NOISES IN TRANSMISSION

Masaki Inui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Dec. 28, 1982, Ser. No. 453,840

Int. Cl.³ F16H *55/18*

U.S. Cl. 74—409 **5 Claims**



1. A gear assembly including a pair of driving and driven helical gears permanently in meshing engagement with each other to provide a torque transmission therebetween, and an additional plate-like gear formed at its outer periphery with helical teeth the helix angle of which is different from each helix angle of respective teeth of said driving and driven helical gears and being resiliently deformable in an axial direction, said additional plate-like gear being concentrically rotatable on a hub portion of either one of said driving and driven helical gears and being successively meshed at the two teeth thereof with one tooth of the other gear in such a manner that said additional plate-like gear is resiliently in contact with one end face of said helical gear adjacent thereto at its radially opposed portion.

4,519,265

DAMPENING SHOES FOR SYNCHRONIZER GEARS

Courtney F. Dolan, Syracuse, and Stewart J. Woodcock, Fayetteville, both of N.Y., assignors to Chrysler Corporation, Highland Park, Mich.

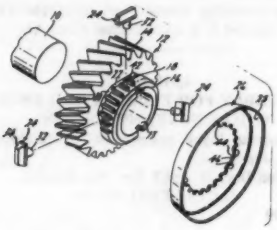
Filed Jul. 7, 1983, Ser. No. 511,604

Int. Cl.³ F16H *55/14*

U.S. Cl. 74—443 **4 Claims**

1. An anti-rattle arrangement for dampening oscillatory vibrations in a power transmission synchronizer mechanism having an input shaft provided with a journal surface, an input main gear having a through bore bearing surface received on said journal surface, said main gear including a reduced diameter shoulder portion formed with axially extending external jaw teeth, and a stop ring having a central opening therein formed with internal teeth adapted for slidable engagement with said shoulder jaw teeth, said anti-rattle arrangement comprising a plurality of chordal surfaces formed on said shoulder portion, a radial bore in each said chordal surface, said radial bore having its axis in a longitudinal radial plane of said main gear principal axis and oriented equidistant from two adjacent shoulder external jaw teeth, said stop ring having a plurality of

gaps formed by certain ones of its internal teeth being omitted, each said stop ring gap having its radial axis of symmetry located in said radial plane when said synchronizer mechanism is in its neutral condition, a plurality of T-like shoes molded of elastomeric material, each said shoe including a cross-head portion and a stem portion, each said shoe stem portion received in one of said radial bores, each said cross-head underface seated flush with its associated chordal surface, and each



said cross-head sized for snug reception in an associated stop ring gap upon said stop ring being axially seated on said reduced diameter shoulder and its internal teeth in meshing engagement with said external jaw teeth, such that said shoes maintain said stop ring gear internal teeth in spaced relation with said external jaw teeth, so as to obviate rattle between said main gear and said stop ring gear during no-load conditions of said synchronizer mechanism.

4,519,266

GEAR SELECTOR UNIT FOR A TRANSMISSION

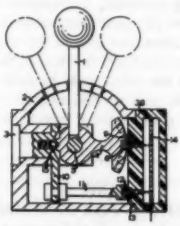
Erich Reinecke, Burgdorf, Fed. Rep. of Germany, assignor to WABCO Fahrzeugbremsen GmbH, Hanover, Fed. Rep. of Germany

Filed Sep. 20, 1982, Ser. No. 420,079

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1981, 3138827

Int. Cl.³ G05G *9/00;* **B60K** *20/00;* **H01H** *9/06, 9/00*

U.S. Cl. 74—471 XY **4 Claims**



1. A gear selector unit for manual selection of the gears in a transmission comprising:

(a) a housing;

(b) a plurality of magnetic sensors installed in said housing;

(c) a gear shift lever pivotally connected to said housing by gimbals, so as to rotate about a first axis for selection of the shift path and about a second axis for selection of the desired gear, said gear shift lever comprising:

(i) a first arm having an arcuate end on which at least one magnet is mounted in magnetic proximity with at least one of said plurality of magnetic sensors to provide an indication of the shift path in which said gear shift lever is positioned by rotation about said first axis; and

(ii) a second arm having at least one magnet mounted thereon in magnetic proximity with at least one of said plurality of magnetic sensors to provide an indication of the desired gear in the selected shift path by rotation of said gear shift lever about said second axis, thereby providing a signal corresponding to the desired transmission gear according to the gear shift lever position without physical engagement between said magnets and sensors.

4,519,267

AUTOMOTIVE MANUAL TRANSMISSION

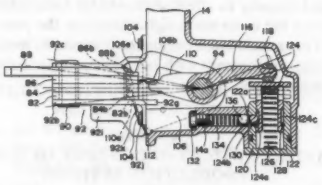
Kotei Takahashi, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Japan

Filed Feb. 19, 1982, Ser. No. 350,388

Claims priority, application Japan, Feb. 20, 1981, 56-22885

Int. Cl.³ B60K *20/00*

U.S. Cl. 74—473 R **10 Claims**



1. In an automotive manual transmission including a control rod, for establishing a speed change of the transmission, the control rod being rotatable about and slidable along a longitudinal axis thereof to achieve selecting and shifting operation, an arrangement which comprises:

an arm secured to said control rod to be movable therewith;

a hollow holder secured to the transmission housing with and open end of the holder having at a side wall section thereof a through hole;

a piston axially movably received in said holder and having at a side section thereof a recess mating with said through hole of said holder when said piston assumes a predetermined position, said piston being contactable with a leading end of said arm when said arm rotates with the control rod about said axis through a predetermined angle in a direction toward said piston;

first biasing means for biasing said piston toward the leading end of said arm so that upon contact of said piston with said leading end, said arm and thereby said control rod are biased to rotate in a direction away from the piston;

a detent member slidably received in said through hole of said holder with a portion of the detent member projecting into said recess of the piston;

second biasing means for biasing said detent member toward the bottom of said recess, said second biasing means being received in a hole formed within the transmission housing; and

wherein said transmission housing is formed with a through hole into which said hollow holder is inserted from outside the transmission housing and secured thereto for positioning within the housing.

4,519,268

GEAR SHIFT APPARATUS FOR MANUAL TRANSMISSION

Masatoshi Oda, Atsugi, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 7, 1983, Ser. No. 472,751

Claims priority, application Japan, Mar. 9, 1982, 57-35835

Int. Cl.³ G05G *9/12*

U.S. Cl. 74—473 P **12 Claims**

1. A gear shift apparatus for a manual transmission, comprising:

a retainer member securely connected to an extension housing connected to a transmission housing and formed with a hollow cylindrical section a part of which extends into said extension housing, said cylindrical section being

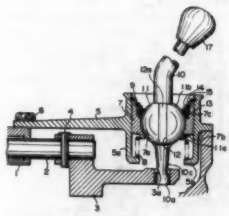
formed at its inner peripheral surface with straight grooves;

a cylindrical socket member slidably disposed in said cylindrical section and having a spherical surface;

a first spring interposed between one end portion of said cylindrical section and said socket member to bias said socket member in a direction;

a first stop member securely disposed at the other end portion of said cylindrical section to restrict the movement of said socket member in said direction;

a spherical projection formed at its pivotally supported section of a shift lever and formed with straight grooves, the outer spherical surface of said spherical projection



being in slidable contact with the spherical surface of said socket member, said spherical projection being mechanically connected to a transmission mechanism of the transmission;

an annular support member disposed on the inner surface of said socket member and formed with a spherical surface in slidable contact with the spherical projection outer surface; and

pins passing through the wall section of said socket member and each of which has a first end in engagement with said spherical projection straight grooves, and a second end in engagement with one of said cylindrical section vertical grooves.

4,519,269

TRANSMISSION SYSTEM IN A CAM MECHANISM

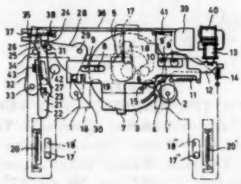
Yukio Itoh; Kazuki Takai, and Satoshi Takagi, all of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Jun. 11, 1982, Ser. No. 387,909

Claims priority, application Japan, Jun. 19, 1981, 56-94838; Jun. 23, 1981, 56-95937

Int. Cl.³ G11B *5/54, 21/22*

U.S. Cl. 74—483 R **4 Claims**



1. A power transmission system, comprising:

a rotatable power member;

a rotatable engage member defining with said power member an intermittent power transmission device so that rotation of said power member imparts intermittent rotation to said engage member, said engage member having a rest period in which it does not rotate during each revolution of said power member;

a rotatable cam member coupled to said engage member for simultaneous rotation therewith;

a changeover member and means mounting said changeover member for shifting movement in response to rotation of said cam member between a first position and a second position;

select means for selectively releasably holding said changeover member in said first position or releasing said changeover member so that said changeover member is free to shift to said second position in response to rotation of said cam member;

an operating member and means mounting said operating member for shifting movement between third and fourth positions;

a movable control member operatively connected between and coupled to said changeover member and said operating member for causing said operating member to shift between said third and fourth positions in sequence with and in response to movement of said changeover member between said first and second positions;

a movable lock member releasably lockingly engageable with said control member to releasably lock same against movement when said operating member is in said fourth position whereby to hold said operating member in said fourth position; and

release means for releasing said control member from locking engagement with said lock member whereby to permit said operating member to be shifted to said third position.

4,519,270

FOOT-OPERATED CONTROL DEVICE FOR PARKING BRAKE

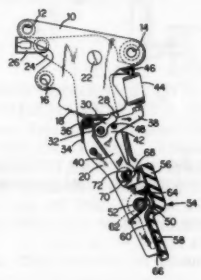
Hiroshi Kawaguchi, Mishima, and Shuho Nishina, Susono, both of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Nov. 10, 1982, Ser. No. 440,610

Claims priority, application Japan, Nov. 16, 1981, 56-170444[U]; Nov. 18, 1981, 56-171704[U]

Int. Cl.³ G05G *5/06*

U.S. Cl. 74—535 **15 Claims**



1. A foot-operated device for controlling a parking brake of a vehicle, comprising:

a sector fixed to a frame of the vehicle and having ratchet teeth formed along a circular arc;

a parking brake pedal connected to said sector pivotally about a center of said circular arc;

a pawl member pivotally connected to said brake pedal and having at one end thereof a pawl engageable with said ratchet teeth;

a lever pivotally connected to said brake pedal and having engaging means engageable with one side surface of said pawl member to pivot same in a first direction that causes said pawl to engage said ratchet teeth, said lever being pivotable in a second direction opposite to said first direction without engagement of said engaging means with said pawl member;

a first spring member associated with said lever and biasing the lever in said first direction, a biasing force of said first

spring member being transmitted to said pawl member through said engaging means of said lever to bias the pawl member in said first direction;

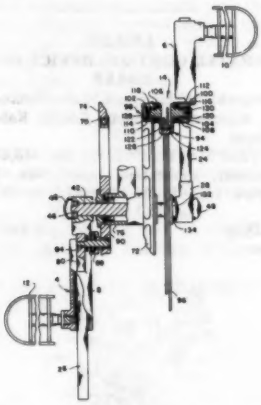
a pedal pad pivotally connected to said brake pedal and foot-operated to pivot said brake pedal in one direction toward its operated position for applying a parking brake, said pedal pad being engageable with said lever and pivoting same in said second direction against the biasing force of said first spring member when said pedal pad is pivoted in another direction opposite to said one direction; and

a second spring member directly biasing said pawl member in said second direction so as to cause said pawl to disengage from said ratchet teeth, a biasing force of said second spring member being smaller than an engagement force existing between said pawl member and said ratchet teeth in engagement with said pawl member.

4,519,271
PEDAL TELESCOPING DEVICE

Jesse Chattin, 7201 S. 49th Ave., Tampa, Fla. 33619

Filed Apr. 9, 1982, Ser. No. 367,029
Int. Cl.³ G05G *1/14*
U.S. Cl. 74—594.3 **6 Claims**



1. An apparatus for telescoping a pedal of a pedal assembly between a retracted and extended position, said apparatus comprising:

a spindle housing having an axle shaft rotatable disposed therein;

a cam plate mounted on said axle shaft such that said cam plate is stationary relative said to housing;

a cam ring radially spaced from said cam plate by a ring bearing disposed circumferentially between said cam plate and said ring bearing;

a pedal arm attached to said shaft;

a pedal guide slidably mounted on said pedal arm, the pedal being attached to said pedal guide;

a first lead bolt assembly attached to said pedal guide for interconnecting said pedal guide to said cam ring;

a chain sprocket attached to said axle shaft to rotate with said axle shaft, said chain sprocket being disposed between said pedal arm and said cam ring;

said first lead bolt assembly further including:

an inner lead bolt element rotatably secured to said cam ring;

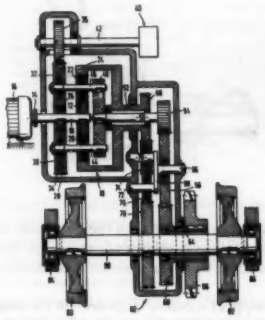
an outer lead bolt element rotatably secured to said pedal guide; and

a bridge coupling extending through said chain sprocket and between said inner and outer lead bolt elements for coupling said cam ring and said pedal guide together for moving the pedal between the retracted and the extended positions.

4,519,272
TRANSMISSION HAVING A CONSTANT TORQUE RATIO OUTPUT AT A VARIABLE SPEED RATIO OUTPUT

Bruno Meier, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jun. 22, 1982, Ser. No. 390,947
Claims priority, application Switzerland, Jul. 15, 1981, 4634/81
Int. Cl.³ F16H *3/74;* B61C *11/00*
U.S. Cl. 74—752 R **18 Claims**



1. A transmission comprising

a power division transmission having a power input shaft, a first branched transmission connected with said input shaft and a second branched transmission connected with said input shaft said branched transmissions characterized in having a constant torque ratio

a differential transmission connected with each said branched transmission and having a rotatable transmission part for rotation in response to a slip between said branched transmissions;

a braking means for selectively braking said rotatable transmission part; and

a speed control means connected solely to said rotatable transmission part for limiting the speed of said part to limit said slip between said branched transmissions, said speed control means including a speed senser for sensing the speed of said transmission part and emitting a signal in response thereto, and a control facility connected between and to said senser and said braking means for receiving said signal and selectively actuating said braking means in response to said signal.

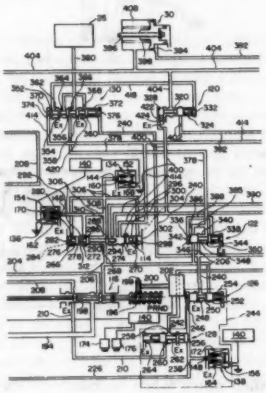
4,519,273
AUTOMATIC TRANSMISSION FOR VEHICLES

Takeo Shimizu; Takeo Hiramatsu; Bonnosuke Takamiya, and Hiroshi Fukuchi, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 5, 1982, Ser. No. 432,875
Claims priority, application Japan, Oct. 6, 1981, 56-159058
Int. Cl.³ F16H *3/74;* G05G *11/00;* B60K *41/08*
U.S. Cl. 74—752 A **15 Claims**

15. An automatic transmission for a vehicle, comprising; forward switch means by which a driver instructs forward driving, reverse switch means by which a driver instructs reverse driving, vehicle sensor means for detecting a stopped state of the vehicle, electronic control means for transmitting an output signal for selectively instructing a forward driving condition, a reverse driving condition or a neutral condition according to input signals from said switch means and said vehicle sensor, and actuator means for selectively attaining one

of said driving conditions in response to said output signal from said electronic control device, in a manner such that when a operational state of one of said forward and reverse switch means and a signal indicating the stopped state of said vehicle from said vehicle sensor are detected by said electronic control means, said forward or reverse driving condition corresponding to said switch means in the operational state is attained by said actuator means, whereas a non-operational state of both said switches is detected by said electronic control means, said actuator means attains said neutral condition, and further including key switch detection means, engine speed detection means, seat switch means and a driving condition changeover valve, said electronic control means operating said condition changeover valve so as to assume a neutral position upon the detection by the former of the non-operational states of both said forward and reverse switch means, and to assume a park or transmission lock position upon detection of said stopped state and an OFF position of said key switch, said forward and reverse switch means being placed in said non-operational state condition upon detection of a substantially zero output of said engine speed detection means.



4,519,274

AUTOMATIC SPEED RANGE CHANGE-OVER SYSTEM FOR A HYDRO-MECHANICAL TRANSMISSION

Ryoichi Maruyama; Takayoshi Nishijima; Hideaki Aida, all of Yokohama; Hideyuki Konishi, Kamakura, and Keiji Hatayama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,663

Claims priority, application Japan, Feb. 17, 1982, 57-22820

Int. Cl.³ B60K *41/18;* F16H *47/04*

U.S. Cl. 74—866 **3 Claims**

1. An automatic speed range change-over system for a hydro-mechanical transmission of a vehicle including an engine, mechanical transmission means connected to the engine and having a plurality of speed range change-over clutches each having clutch elements to be engaged, a pair of hydraulic pumps driven by the engine, and a pair of hydraulic motors each driven by the respective hydraulic pumps and operatively connected to the mechanical transmission, said speed range change-over system comprising:

engine speed detector means for detecting actual engine speed and generating a first signal;

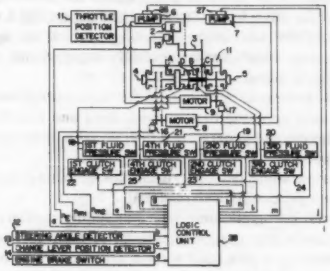
motor speed detector means for detecting the speed of the hydraulic motors and generating a second signal;

means for selectively detecting one of the speed range change-over clutches currently engaged and generating a third signal;

arithmetic unit means for calculating relative number of revolutions between the clutch elements of an other clutch adjacent to the one clutch currently engaged based upon the first, second and third signals fed therein and generating a fourth signal indicating the relative number of revolutions between the clutch elements of said other clutch;

comparator means for comparing the relative number of revolutions with a predetermined value stored therein and generating a fifth signal if the relative number of revolutions becomes less than the predetermined value;

means for generating speed range change-over signal based upon the fifth signal;



fluid supplying means for supplying fluid to the speed range change-over clutches; and

switch means responsive to the speed range change-over signal for directing fluid from said fluid supplying means to said other clutch to be engaged;

upon engagement of said other clutch said means for selectively detecting one of the speed range change-over clutch currently engaged being adapted to send out a sixth signal to said means for generating speed range change-over signal thereby disengaging the one clutch currently engaged.

4,519,275

TURNING CONTROL SYSTEM FOR A HYDRO-MECHANICAL TRANSMISSION

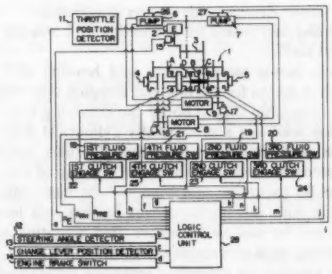
Ryoichi Maruyama; Takayoshi Nishijima; Hideaki Aida, all of Yokohama; Hideyuki Konishi, Kamakura, and Keiji Hatayama, Yokohama, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,665

Claims priority, application Japan, Feb. 17, 1982, 57-22821

Int. Cl.³ B60K *41/18;* F16H *47/04*

U.S. Cl. 74—866 **3 Claims**



1. A turning control system for a hydro-mechanical transmission of a vehicle including an engine, mechanical transmission means connected to the engine and having a plurality of

speed range change-over clutches, a pair of output shafts connected to the mechanical transmission means, a pair of hydraulic pumps driven by the engine, a pair of hydraulic motors each driven by the respective hydraulic pumps and operatively connected to the mechanical transmission, and a change lever for changing forward and reverse running of the vehicle, said turning control system comprising:

engine speed detector means for detecting an actual engine speed and generating a first signal;

first motor speed detector means for detecting the speed of one of the hydraulic motors and generating a second signal;

second motor speed detector means for detecting the speed of the other hydraulic motor and generating a third signal;

means for selectively detecting one of the speed range change-over clutches currently engaged and generating a fourth signal;

first arithmetic unit means for calculating vehicle speed based upon the first, second, third and fourth signals fed therein and generating a fifth signal indicating the vehicle speed;

steering angle detector means for detecting steering angle and generating a sixth signal;

second arithmetic unit means including memory means for memorizing optimum radii of turning corresponding to steering angles, said second arithmetic unit means being adapted to compare current radius of turning with the optimum radius of turning corresponding to the current steering angle and vehicle speed and send out a seventh signal;

change lever position detector means for detecting change lever positions among neutral, forward and reverse positions and generating an eighth signal;

third arithmetic unit means for feeding the seventh and eighth signal and generating a ninth signal;

a pair of actuators for controlling displacement volume of the associated hydraulic pumps; and

a pair of adder means each connected with said third arithmetic unit means and respective actuators, each of said adder means being adapted to feed said ninth signal and send out a tenth or eleventh signal to said respective actuators, said tenth and eleventh signals being such signals which will gradually approximate said seventh signal to zero.

4,519,276

POWER DRIVEN BOTTLE OPENER

David L. Grabarski, and Harvey A. Williams, both of 247 Walnut Ave., Bellmawr, N.J. 08031

Filed Dec. 21, 1983, Ser. No. 563,777
Int. Cl.[3] B67B 7/18
U.S. Cl. 81—3.2 **7 Claims**

1. A power driven bottle opener comprising:

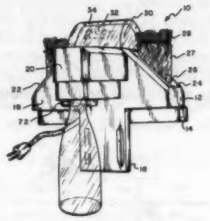
a housing and means for supporting said housing on a support surface;

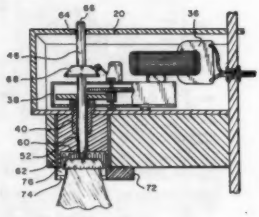
electric motor means within said housing and including switch means for starting and stopping said motor means;

an inverted cup-shaped bottle cap removing head including a top wall and a substantially cylindrical side wall, said side wall including a plurality of axially extending ribs thereon for engaging the screw top cap of a bottle;

means for mounting said head and for interconnecting the same with said motor means so that said head can be rotated by said motor means, said mounting means preventing axial movement of said head;

a cap ejection pin extending vertically within said housing, said pin being substantially coaxial with said head and being mounted for limited axial movement between a lower position wherein the lower end of said pin is within said head and below the top wall thereof and an upper position wherein the upper end of said pin is accessible from the top of said housing so that said pin can be manually pushed down when necessary to eject a removed bottle cap which may become lodged within said head.



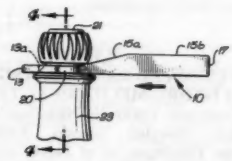


4,519,277

CHAMPAGNE BOTTLE OPENER

Clifford G. Raab, 3977 Aladdin Dr., Huntington Beach, Calif. 92649

Filed Sep. 4, 1984, Ser. No. 647,357
Int. Cl.[3] B67B 7/06
U.S. Cl. 81—3.55 **12 Claims**



1. A device for removing sparkling wine bottle caps of the type having a head portion and an integral stem, press-fitted into a bottle having a flange adjacent its top end, comprising:

a one-piece elongated, nominally flat member of rigid material forming a frame about a "keyhole" opening through the flat projection of said member, said keyhole opening having a generally circular portion adjacent a first end of said member and a slot portion extending from said circular portion toward a second end of said member, said circular opening portion having a diameter greater than that of said cap and said slot portion having a lateral dimension within said frame less than the diameter of said head portion of said cap;

a butt portion extending beyond said slot portion to said second end;

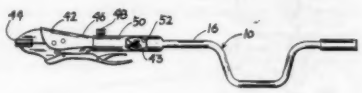
and ramps sloped upward toward said butt portion and being formed in said frame laterally bounding said slot portion to apply a lifting force to said cap with respect to said bottle flange in response to a compression force applied in the direction from said second end to said first end.

4,519,278

BRACE EXTENSION FOR LOCKING PLIERS

Carl R. Heldt, 320 S. Country Club, Tucson, Ariz. 85716

Filed May 16, 1983, Ser. No. 495,103
Int. Cl.³ B25B *7/00*; B25G *1/00*
U.S. Cl. 81—427.5 **2 Claims**



1. An improvement to a pair of locking pliers of the type having two jaws and a jaw throat adapted to hold a workpiece therebetween, an elongated handle having a longitudinal axis, the jaws and the jaw throat aligned in the longitudinal axis of the pliers' handle, and a jaw adjusting screw at one end of the handle for adjustment thereof, the improvement comprising:

an elongated cylindrical collar with one closed end, said collar adapted to surround a portion of the pliers' handle, said collar including a key attached interiorly to said cylindrical collar adapted to engage a channel formed in the pliers' handle, and a set screw threaded through said elongated cylindrical collar, both said set screw and said key adapted to forcibly engage the pliers' handle to hold said collar thereon, said collar further including at least two oppositely located openings in the sides of said cylindrical collar allowing entrance to the jaw adjusting screw at the end of the pliers' handle for adjustment thereof; and

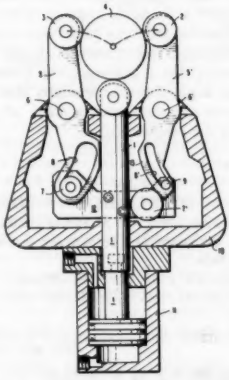
an elongated brace consisting of a rotatable handle portion, a shank portion, and an off-set handle portion connecting the shank portion to the rotatable handle portion, said brace rotatable handle portion and shank portion rotatable about an axis, said brace shank portion adapted to be attached to said collar whereby said elongated brace rotational axis aligns with the workpiece held in the pliers' jaw so when the pliers are desired to be put into use for extraction or rotating a workpiece held in the pliers' jaws, an operator may extract or rotate the workpiece by operation of the elongated brace.

4,519,279

SELFCENTERING WORK-REST

Stefano Ruggeri, 8, Via Portazza, I 40139, Bologna, Italy

Filed Aug. 18, 1982, Ser. No. 409,214
Claims priority, application Italy, Sep. 16, 1981, 3530 A/81
Int. Cl.³ B23B *25/00*
U.S. Cl. 82—38 R **2 Claims**



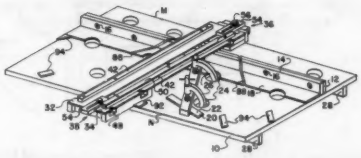
1. A self-centering work support comprising a support body, a push rod slidably mounted in said body, and having workpiece support means on one end thereof, power means for reciprocating said pushrod in said support body, a pair of two arm levers, means for pivotally and detachably mounting said levers on said body on opposite sides of said push rod with workpiece support means provided on one arm of each lever and a curved cam slot in the other arm of each lever, a cross arm, means for detachably mounting said cross arm on said push rod and a pair of rollers, means rotatably mounting said rollers on said crossarm with each roller disposed within a respective slot so that upon reciprocating movement of said push rod said arms will be pivoted to bring said workpiece support means into and out of engagement with a workpiece.

4,519,280

MITER BOARD AND SAW GUIDE

Carl E. Cook, 2120 Canyon Dr., Amarillo, Tex. 79109

Filed Jul. 29, 1983, Ser. No. 518,649
Int. Cl.³ B27B *9/04*
U.S. Cl. 83—34 **11 Claims**



1. The method of making a cut at a desired angle in workpieces having

a. a side and

b. a corner at an end of the side; using

c. a power saw having

d. a circular saw blade extending through

e. a saw base; and

f. a device having

g. a base having a top surface with a substantially planar work area,

h. a saw guide pivoted to the top surface for movement about a pivot axis that is normal to the work area; and

i. the saw guide being adapted to support the saw base above the work area; and

j. the saw being slidably mounted on the saw guide with the saw blade in position to cut along a saw line through a workpiece positioned on the work area as the saw is moved along the saw guide:

wherein the improved process comprises the steps of:

k. positioning the saw guide at a preset location on the top surface with the saw line extending through a slot in a backup on the top surface,

l. selecting an angle mark corresponding to the desired angle from a plurality of preset angle marks on the top surface,

m. positioning the workpiece on the work area with the corner in the slot,

n. aligning the workpiece side with the selected angle mark so that the workpiece side is at the desired angle to the saw line; then

o. spinning the saw blade,

p. sliding the saw base on the saw guide, and

q. spinning the saw blade through the workpiece and into the slot in the backup,

r. unpivoting the saw guide from the base,

s. turning the base over,

t. repivoting the saw guide to a bottom surface of the base,

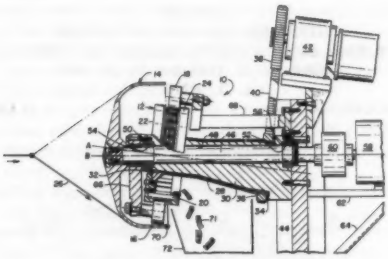
u. placing the workpiece on a substantially planar work area on the bottom surface,

v. aligning the workpiece side with a straight reference line on the bottom surface,

w. pivoting the saw guide about a bottom pivot axis until the saw line is aligned at the desired angle to the reference line; then

x. spinning the saw blade,
y. sliding the saw base on the saw guide, and
z. spinning the saw blade through the workpiece.

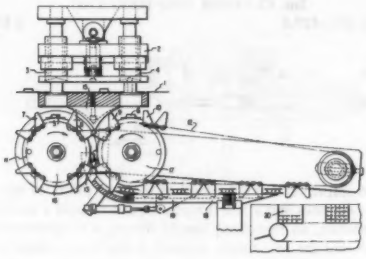
4,519,281
PACKAGE WIND CUTTER
Albert E. Spaller, Johnson City, Tenn., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Mar. 7, 1983, Ser. No. 472,509
Int. Cl.³ D01G *1/04*
U.S. Cl. 83—37 **11 Claims**



1. Apparatus for cutting a strand into predetermined lengths, said apparatus characterized by:
(a) a cutting head mounted for rotation around its axis at a predetermined speed, said cutting head having a plurality of cutting blades mounted and arranged to form a cutting zone of predetermined width and predetermined peripheral length to receive and store in cutting position multiple windings of strand for subsequent cutting into said predetermined lengths;
(b) strand winding means mounted to rotate around an axis intercepting said axis of the cutting head in such manner that said strand winding means traverses back and forth along a predetermined width of said cutting zone during each revolution of the strand winding means, said strand winding means rotating at a significantly faster speed than said cutting head and the relative rotations of said strand winding means and said cutting head cooperating to position multiple crossing windings of said strand in said cutting position for said subsequent cutting; and
(c) means for applying pressure at predetermined locations against said windings and toward the cutting edges of said blades to cut said strand into said predetermined lengths.

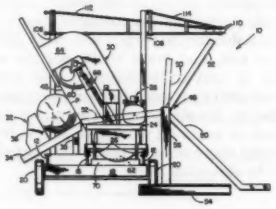
4,519,282
METHOD FOR BOXING BUBBLE STRIPS
Leo Masino, Karlsruhe, Fed. Rep. of Germany, assignor to E. Th. Noack Verpackungsmaschinen, Karlsruhe, Fed. Rep. of Germany
Filed Jun. 2, 1982, Ser. No. 384,382
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1981, 3122271
Int. Cl.³ B26D *7/32*
U.S. Cl. 83—85 **2 Claims**

1. A machine for cutting a band containing individually packaged products into identical bubble strips each containing a plurality of the individually packaged products disposed at regular intervals along the strip and protruding transversely from one side of the strip, and for assembling such strips, said machine comprising: two cutting units disposed for simultaneously cutting two such bubble strips from the band; and a transporting device for moving said cut strips with a timed advance and disposed for receiving the two simultaneously cut strips from said cutting units, said transporting device comprising means for orienting the two strips relative to one another such that the packaged products on each strip protrude toward the other strip and the packaged products on one strip are offset from the packaged products on the other strip, and means for pushing the two strips, after they have been so



oriented, toward one another such that the products of one strip are adjacent those of the other strip and the strips are nested together.

4,519,283
BAND SAWMILL
Dale Sanborn, South Waterford, Me. 04081
Filed Jul. 21, 1983, Ser. No. 516,057
Int. Cl.³ B27B *15/00*
U.S. Cl. 83—104 **12 Claims**



1. A sawmill for cutting planks from logs, including an elongated main frame, a portion of which comprises a cradle or bunk to support a log horizontally for cutting, a saw-supporting sub-frame mounted on said main frame for reciprocatory horizontal movement along a substantial portion of its length including the said cradle portion, an endless band saw mounted on said subframe for movement therewith and with its active cutting portion inclined at an acute angle to vertical from an apex below the cradled log whereby to define the plane of cut at said angle to vertical, and means associated with said cradle for periodically moving the log toward the cuting plane at substantially a right angle thereto, whereby during cutting travel of the saw with the sub-frame, a plank of determined thickness is cut from the cradled log.

4,519,284
UNIVERSAL SHEET METAL HOLDER
James R. Hunter, Chadds Ford, and S. James Lazzarotti, Broomall, both of Pa., assignors to The Warner & Swasey Company, Cleveland, Ohio
Filed Jul. 26, 1982, Ser. No. 401,446
Int. Cl.³ B26D *5/20, 7/06;* B25B *1/04*
U.S. Cl. 83—410 **18 Claims**

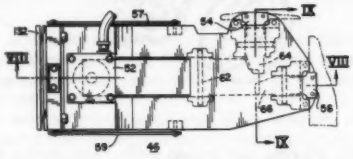
6. Positioning apparatus for positioning a worksheet comprising:
a worktable for supporting the worksheet;
a carriage extending above and across said worktable permitting full access to sid worktable beneath said carriage and being movable along said worktable;

a cross slide supported from and movable across said carriage;

a pair of sheet metal grippers extending from and supported by said cross slide and movable along said cross slide; and,

each of said pair of grippers constructed to grip a side of the worksheet, extending perpendicular to and beneath said carriage, and alternately to grip an end of the worksheet, extending parallel to said carriage across the front of said pair of grippers.

7. Positioning apparatus as claimed in claim 6 wherein said gripper comprises:



a first pair of gripping jaws extending from the end of each gripper for gripping the end of the worksheet extending parallel to the carriage; and,

a second pair of gripping jaws extending from the side of each gripper for gripping the side of the worksheet which extends perpendicular to the carriage.

8. Positioning apparatus as claimed in claim 6 comprising:

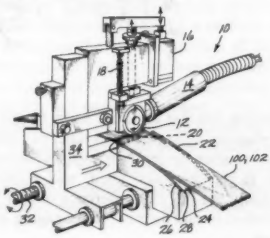
a pair of workpiece gripping jaws extending at an angle from the end of each said gripper for gripping a worksheet along a gripping line which extends transverse to said carriage.

4,519,285

CUTTING METHOD AND APPARATUS FOR TAPE LAYING MACHINES

Helmut Dontscheff, Tacoma, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jun. 30, 1983, Ser. No. 509,665
Int. Cl.³ B26D *3/08*
U.S. Cl. 83—880 **7 Claims**



1. An improved tape laying machine of the type in which a tape to be laid is transported by a continuous strip of backing material and which has cutting means for making lateral cuts through the tape of essentially constant depth, wherein the improvement comprises:

a guide surface along which the tape and backing material move into position for the tape to be cut by the cutting means; said guide surface including two longitudinally spaced longitudinal sections, each of which has an essentially flat center portion and opposite side portions that are inclined toward the cutting means relative to the flat center portion; and

a support surface positioned longitudinally between said longitudinal sections and facing the cutting means for supporting the tape and backing material when the tape is being cut;

wherein said side portions guide the lateral edge portions of the tape and backing material, along the guide surface and across the support surface, to bend toward the cutting means and away from the support surface when a lateral cut is being made, to allow a cut of essentially constant depth to completely sever the tape, including any fibers that may have come loose from the edges of the backing material, without severing the backing material; and

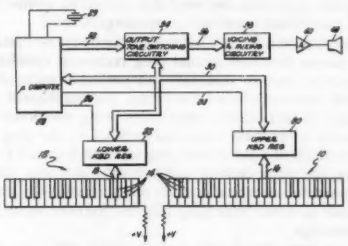
wherein said flat center portions are sufficiently wide to provide an uncut center portion of the backing material that is sufficiently wide to prevent any nicks in the lateral edge portions of the backing material from impairing the transport of the tape by the backing material.

4,519,286

METHOD AND APPARATUS FOR ANIMATED HARMONIZATION

Robert J. Hall, Chatsworth; George R. Hall, Sherman Oaks, and Jack C. Cookerly, Saugus, all of Calif., assignors to Norlin Industries, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 274,606, Jun. 17, 1981,. This application Jun. 24, 1982, Ser. No. 391,764
Int. Cl.³ G10F *1/00*
U.S. Cl. 84—1.03 **5 Claims**



1. A method for deriving, in response to a melody note signal and a chord signal, a plurality of signals representing a corresponding plurality of accompaniment notes harmonically related to said melody note and to said chord and temporally related to effect a predetermined musical style, said method comprising the steps of:

(a) storing a plurality of groups of listings of accompaniment notes, each of said listings of a group corresponding to a chord type and providing at least one accompaniment note harmonically related to each melody note of the chromatic scale with respect to said chord type;

(b) said groups being arranged so that the listings of accompaniment notes for a particular musical chord type are related from group to group in accordance with said predetermined musical style;

(c) providing at least one preselected constant time value; then

(d) associating a time value with at least one of said groups of listings;

(e) deriving the root and type of said chord from said chord signal;

(f) deriving said melody note from said melody note signal; then

(g) selecting listings from said plurality of groups in accordance with the type of said chord; then

(h) locating in each of said listings at least one accompaniment note according to said chord root and melody note; and then

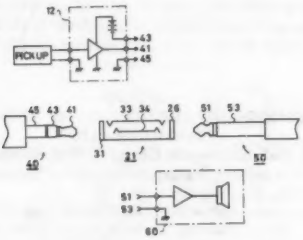
(i) sequentially generating a plurality of accompaniment note signals, each of said signals being responsive to said at least one accompaniment note of a selected listing and at least one of said signals having a duration corresponding to the constant time value associated with the group from which it is derived.

4,519,287

OUTPUT JACK FOR ELECTRIC GUITAR

Fumio Naruse, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 25, 1984, Ser. No. 573,518
Claims priority, application Japan, Feb. 10, 1983, 58-18470[U]
Int. Cl.³ G10H *3/00*
U.S. Cl. 84—1.16 **2 Claims**



1. A combined output jack and amplifier switching assembly in an electric guitar of the type having an amplifier and a battery for powering the amplifier contained within the body of the guitar, said assembly comprising:

a jack mounted in a wall of said guitar body, said jack having separate first and second plug receiving openings in respective ends thereof, said jack having an outer shield and two resilient contact electrodes interior thereof, the first ends of said contact electrodes being positioned respectively to provide electrical contact to the ring and tip terminals of a three wire plug inserted into said first opening, the other ends of said contact electrodes being positioned for electrical contact respectively with the tip and shaft of a two wire plug inserted into the second of said openings,

a three wire plug having a shaft, a ring and a tip, said plug having its tip wired to the output of said amplifier, having its ring wired to one terminal of said battery, the other terminal of said battery being connected to said amplifier, and the shaft of said plug being wired to amplifier ground, said plug being insertable into said first opening interiorly of said guitar, whereby when said two wire plug is inserted into said second opening, an electrical circuit will be completed from said battery to said amplifier via the ring terminal of said three wire plug, one of said resilient contact electrodes, the shaft of said two wire plug, the outer shield of said jack and the shaft of said three wire plug back to amplifier ground, so that removal of said second plug will disconnect the battery from said amplifier.

4,519,288

DRUM BAFFLE SYSTEM

Alan L. Aluisi, 4359 Batavia, Denver, Colo. 80220

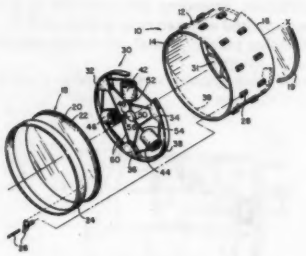
Filed Apr. 13, 1984, Ser. No. 600,327
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—411 M **18 Claims**

1. A baffling system for altering the sound produced by a drum of the type having a tubular drum shell with a central longitudinal drum axis and at least one batter head attached at one end of the drum shell comprising:

first baffle means for dampening vibrations in the drum batter head mounted in fixed relationship with the inner wall of the drum shell and contacting an inner peripheral surface portion of the drum batter head;

second baffle means for deepening the drum tone positioned in radially inwardly spaced relationship from the drum shell inner wall and spaced radially outwardly from the drum central longitudinal axis in contacting relationship with an inner surface of the drum batter head; and

second baffle suspension means for resiliently biasing said second baffle means against the batter head inner surface and for maintaining said second baffle means in radially fixed axially displaceable relationship relative said drum



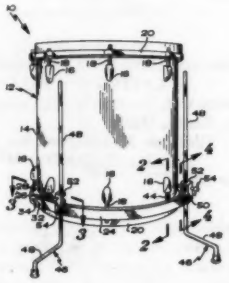
shell whereby said second baffle means makes substantially continuous contact with said drum head during vibrating and non-vibrating states of said drum head.

4,519,289

ADJUSTABLE CIRCUMFERENCE FLOOR TOM STAND

Gary L. Gauger, 15108 Highland La., Minnetonka, Minn. 55343

Filed Jan. 9, 1984, Ser. No. 569,447
Int. Cl.³ G10D *13/02*; G10G *5/00*
U.S. Cl. 84—421 **8 Claims**



1. A mounting bracket for floor toms having a cylindrical shell and a plurality of lugs, said bracket comprising:

an arcuate member having two ends and having a diameter slightly larger than said shell, said member extending substantially the full circumference of said shell;

means attached to said member for engaging at least three of said lugs;

support means attached to said member for supporting said drum over a surface; and

means attached to said member for varying the circumference thereof.

4,519,290

BRAIDED PREFORM FOR REFRACTORY ARTICLES AND METHOD OF MAKING

Frank S. Inman, Brigham City; Donald C. Giedt, Pleasant View, both of Utah, and Donald V. Lushis, Newark, Del., assignors to Thiokol Corporation, Chicago, Ill.

Filed Nov. 16, 1983, Ser. No. 552,565
Int. Cl.³ D04C *1/02, 1/06, 3/40*
U.S. Cl. 87—7 **12 Claims**

1. A braided fiber preform for an annular refractor article comprising the combination of:

a plurality of closely spaced annularly distributed carbon rods;

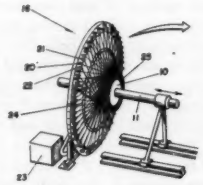
a tubular triaxial braid of carbon fiber strands braided in contact with and around said carbon rods, said braid comprising a repetition of braided unit cells each of which is formed of three strands lying in substantially the same plane, each of said carbon rods being oriented at a substantial angle to the plane of an associated one of said unit cells, and

a mandrel of high-temperature resistant material, said mandrel having an external contour that is approximately the same as the internal shape desired for the refractory article;

said carbon rods being inserted in the surface of said mandrel and extending radially therefrom uniformly to an extent approximately the same as that desired for the thickness of the refractory article; and

said mandrel providing a supporting structure for said braided fiber preform during the braiding thereof.

8. A method of making a braided preform for a refractory article comprising the steps of:



partially inserting a plurality of carbon rods into the exterior surface of an annular mandrel having a longitudinal axis and made of high-temperature resistant, low density material, the mandrel having an external shape that is approximately the same as that desired for the inner surface of the article, with the carbon rods being spaced on the mandrel exterior surface and extending radially therefrom to a length that is approximately the same as the desired thickness of the refractory article;

forming a braided annular fiber preform on the mandrel by braiding carbon fiber strands with a uniform tensile stress on each strand on the exterior surface of the mandrel in contact with and around the carbon rods with the strands applied in groups of three, each group having two oblique strands which are passed alternately over and under a longitudinal strand that is positioned in the plane of the axis of the mandrel, with one of the oblique strands being oblique clockwise with respect to the longitudinal strand and the other of the oblique strands being oblique counterclockwise with respect to the longitudinal strand.

4,519,291

LOCKING DEVICE FOR AIR-TO-AIR GUIDED MISSILES

G. Hans J. Seeger, Überlingen; Peter Giesenberg, Salem, and Johannes Steimel, Constance, all of Fed. Rep. of Germany, assignors to Bodenseewerk Geratetechnik GmbH, Uberlingen, Fed. Rep. of Germany

Filed Nov. 9, 1983, Ser. No. 549,878

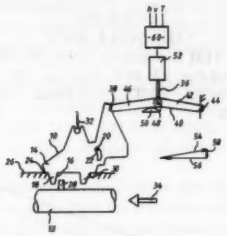
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1983, 3301567

Int. Cl.³ F41F *3/04*

U.S. Cl. 89—1.806 **11 Claims**

1. Locking device for air-to-air guided missiles having a solid propellant rocket motor and having means to delay release of the guided missile, characterized by

(a) means for setting a delay time for release of the guided missile relative to the firing of the rocket motor, said delay time being independent of the thrust of the rocket, and



(b) a blocing device controlled by said setting means to release the guided missile after said delay time.

4,519,292

TURRET ASSEMBLY WITH ARTICULATED COVER FOR ACCESS OPENING

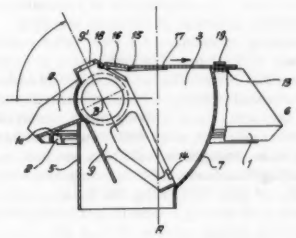
Gert Kausträter, Augsburg, Fed. Rep. of Germany, assignor to KUKA Wehrtechnik GmbH, Augsburg, Fed. Rep. of Germany

Filed Jul. 16, 1982, Ser. No. 398,909

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128861

Int. Cl.³ F41H *5/20*

U.S. Cl. 89—36.13 **11 Claims**



1. In a turret assembly, the combination comprising:

A. a turret having a port in its front wall for the barrel of a weapon and a top wall with an opening therein;

B. a weapon chamber in said turret below said opening in said top wall;

C. a weapon carrier mounted in said weapon chamber for pivotal movement below said turret opening about an axis extending transversely of said chamber and said turret, said carrier and chamber each having openings in their upper portions adjacent to and aligned below said turret opening, the front of said carrier and weapon chamber each having openings therein providing ports aligned with each other and with said port in said turret, said ports providing the functional opening for the barrel of a weapon mounted on said carrier in alignment with said turret opening; and

D. a cover for said turret opening extending rearwardly of and pivotably secured at its forward end to said weapon carrier adjacent the upper end of said port therein, said cover comprising at least two elements pivotably connected to each other, the forward one of which is pivotably secured to said weapon carrier adjacent the upper end of said port therein and the other element being spaced from said ports, said elements being freely slidably relative to said turret top wall, whereby said cover is movable with said weapon carrier during its pivotal movement and is slidable relative to said turret top wall to provide a

closure for said turret opening over said weapon chamber in the various pivoted positions of said weapon carrier.

4,519,293

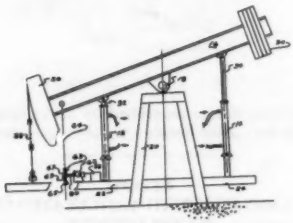
OIL WELL JACK

Joe E. Dooling, 1101 Rio Brazos, Aztec, N. Mex. 87410

Filed Jun. 23, 1983, Ser. No. 507,286

Int. Cl.³ F01L *31/02*; F01B *1/00*

U.S. Cl. 91—178 **5 Claims**



1. An oil well jack comprising in combination:

(a) A walking beam pivotally mounted on a frame for motion in a vertical plane,

(b) a plurality of hydraulic actuators connected between the frame and the walking beam, one on each respective side of the pivot point,

(c) a source of hydraulic fluid under pressure,

(d) a valve to direct the application of hydraulic pressure to the respective actuators in alternate sequence,

(e) an operating mechanism for said valve connected between said walking beam and said valve to control timed valve action comprising a housing, an arm pivtally mounted in said housing, a boss on said arm, means connecting said arm to said walking beam, means connecting said arm to said valve, over center means mounted on said housing to be engaged by said boss, resilient means normally urging said over center means against said boss, and a plurality of pins penetrating the housing and said resilient means each having a loose fit and arranged to move in a semi-circle during motion of said arm in a complete cycle.

4,519,294

POWER ASSISTANCE CONTROL DEVICE

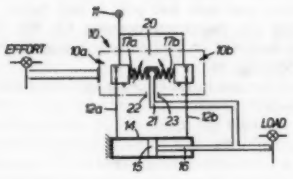
James F. Hemens, Billericay, England, assignor to Teleflex Morse Limited, Basildon, England

Filed Sep. 15, 1983, Ser. No. 532,536

Claims priority, application United Kingdom, Sep. 16, 1982, 8226439

Int. Cl.³ F15B *9/10*

U.S. Cl. 91—374 **10 Claims**



1. A power assistance device comprising:

an input, an output, power assistance means between said input and said output, said power assistance means having piston and cylinder means, whereby said piston means is caused to move in said cylinder means by creating a fluid pressure differential across said piston means, said piston means having piston rod means, whereby said piston means applies load to said output, and

regulator means operable substantially simultaneously with operation of said input, whereby fluid pressure active on said piston means of said power is assistance means is variable, and whereby the effort applied by said piston rod means to said output is proportional to the effort applied to said input, said regulator means further comprising two spring controlled fluid pressure regulators having inlets connected to a fluid pressure source and outlets connected to said cylinder means to apply opposing fluid pressures to said piston means, said piston rod means being connected to a member interposed between the springs of said two regulators, said regulator means further having a body supporting said two regulators, whereby said body is acted upon by said input such as to be caused to move when effort is applied to said input whilst said member is initially stationary when effort is applied to said input, and whereby relative movement occurs between said body and said member which causes differential loading to be applied to said springs of said two regulators in accordance with the effort applied to said input, whereby said two regulators regulate the supply fluid pressures to said cylinder means in accordance with said loadings applied to said regulator springs such that said fluid pressure differential across said piston means is proportional to the difference between said loadings of said regulator springs, and whereby movement of said piston means when subjected to said fluid pressure differential cuases movement of said member relative to said body until the loadings of said springs are such that opposing fluid forces acting on said piston means are balanced.

4,519,295

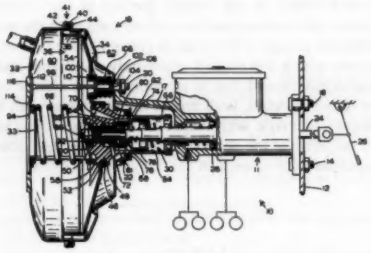
VACUUM BRAKE BOOSTERS

Keith H. Fulmer, South Bend, Ind., assignor to Allied Corporation, Morristown, N.J.

Filed Jun. 2, 1983, Ser. No. 500,517

Int. Cl.³ F15B *9/10*; B60T *13/48*; F01B *11/02*

U.S. Cl. 91—376 R **11 Claims**



5. In a power assist apparatus having a housing formed by connecting a first shell to a second shell to define a cavity therein, said cavity being connected to a source of vacuum to suspend a movable wall located in said cavity, said housing being subjected to a closure force developed by a pressure differential created by the vacuum in said cavity and the air surrounding said housing, said housing being connected to a substantially stationary member by fastener members, the improvement wherein strut means have a first end secured to said first shell and a second end that extend through said cavity to a fixed position adjacent said second shell to oppose said closure force and thereby maintain a minimum internal space relationship between said first and second shell.

4,519,296
CONTROL-CIRCUIT THROTTLE VALVE

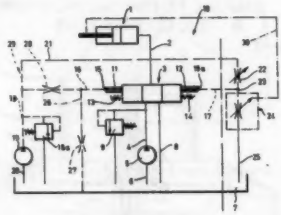
Heinz Schulte, Marktheidenfeld, Fed. Rep. of Germany, assignor to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation of Ser. No. 265,661, May 20, 1981,. This application May 8, 1984, Ser. No. 608,265

Claims priority, application Fed. Rep. of Germany, May 20, 1980, 3019257

Int. Cl.³ F15B *13/16*

U.S. Cl. 91—388 2 Claims



1. A control circuit throttling valve provided as a controlled dimension receiver in a hydraulic circuit for the control of a final control element, comprising:

a housing including a cylindrical bore, a run-off conduit operatively associated with said cylindrical bore and only a single control conduit having a pass through area and communicating with said cylindrical bore, said control conduit having a circular crosssection;

a single movable throttling body having the form of a piston disposed in said cylindrical bore and movable therein, said throttling body having a control surface such that movement of said throttling body controls the degree of communication between said control conduit and said run-off conduit by at least partially closing off said pass-through area through which said control conduit is in communication with said cylindrical bore;

means responsive to an operational condition of said final control element for effecting rotational movement of said single movable thottling body and for varying the magnitude of opening and closing off of said pass-through area as a linear function during rotational movement of said thottling body.

4,519,297
SEALED MOTION TRANSFER APPARATUS UTILIZING A PRESSURE FLUID CYLINDER

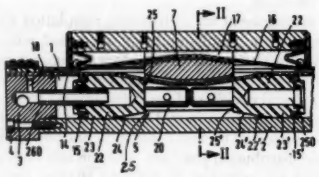
Reinhard Lipinski, Plochingen, Fed. Rep. of Germany, assignor to PROMA Produkt-und Marketing Gesellschaft mbH, Plochingen, Fed. Rep. of Germany

Filed Dec. 19, 1983, Ser. No. 563,028

Claims priority, application European Pat. Off., Jan. 14, 1983, 83100256.3

Int. Cl.³ F16J *1/14;* F01B *1/02*

U.S. Cl. 92—88 20 Claims



1. Sealed motion transfer apparatus having

a pressure cylinder (2) closed at one end and formed with a longitudinal slit (8);

a piston (5) slidable in the pressure cylinder;

a motion transfer element (6) coupled to the piston and having a portion (7) extending through the slit (8) for transferring motion of the piston externally of the cylinder;

a flexible elongated sealing element (14) sealingly positioned in the slit, in a pressurized region of the cylinder; and positioned outside of the slit in a region of the motion transfer element (6) to define an unpressurized region of the cylinder;

guide means (9) secured to the motion transfer element and at least partly surrounding the outside of the cylinder;

and guide tracks (12) formed on the outside of the cylinder and located adjacent opposite sides of the slit to receive the guide means,

wherein, in accordance with the invention,

the piston comprises

two elongated piston parts (22, 22'), each piston part including a piston-cylinder seal (15);

and wherein said piston parts (22, 22') are coupled to the motion transfer element (6) by a radially fioating connection between the piston parts and permitting limited relative radial movement of the motion transfer element with respect to the piston parts.

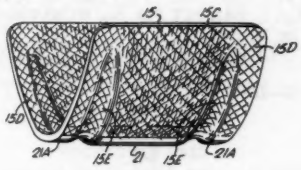
4,519,298
MATERIAL HANDLING DEVICE

Leslie Sumner, Bath, England, assignor to Gallaher Limited, London, England

Division of Ser. No. 468,488, Feb. 22, 1983, , which is a continuation of Ser. No. 211,244, Nov. 28, 1980, abandoned. This application Apr. 11, 1984, Ser. No. 599,270

Int. Cl.³ F16J *3/00;* F04B *43/12*

U.S. Cl. 92—103 F 6 Claims



1. A diaphragm for a diaphragm pump or motor device, having a chamber and deflector means adapted to flex the diaphragm radially, whereby the diaphragm forms a moving wall of a variable volume pumping chamber, said diaphragm comprising a premolded flexible diaphragm, opposite end edges and side edges of said diaphragm, a longitudinally extending central zone of said diaphragm, longitudinal reinforcement within said central zone rendering the diaphragm substantially longitudinally inextensible, a peripheral clamping portion of the diaphragm extending around the full periphery thereof so as to be clampable between first and second housing parts of said pump or motor device, and means defining two longitudinal corrugations in said diaphragm, one on each side of said central zone, between said central zone and said peripheral clamping portion, said corrugations allowing flexing of the diaphragm without any resultant longitudinal or transverse distortion of said central zone.

4,519,299

RECIPROCABLE PLUNGER FUEL INJECTION PUMP

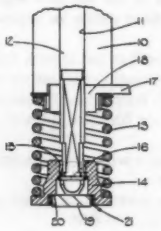
Kieron J. Moloney, Cheltenham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 8, 1983, Ser. No. 502,160

Claims priority, application United Kingdom, Jul. 8, 1982, 8219770

Int. Cl.³ F16J 1/10

U.S. Cl. 92—129 **4 Claims**



1. A reciprocable plunger fuel injection pump comprising a body, a reciprocable plunger mounted within a bore defined in the body or a part thereof, the plunger extending from the bore, a spring abutment mounted about an outer end of the plunger, means connecting the plunger and spring abutment whereby a spring engaged with the abutment biases the plunger outwardly of the bore, a thrust member carried by the spring abutment, said thrust member in use being engaged by an engine driven actuating member, the thrust member engaging the end of the plunger to impart inward movement thereto, said thrust member being detachably mounted on the spring abutment whereby a thrust member of the desired thickness can in use be substituted, resilient means being provided to retain the thrust member relative to the abutment.

4,519,300

FILLED PISTON WITH CENTRAL OIL TUBE

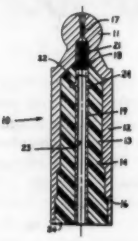
Peter P. Adomis, Jr., Dover, and Millard J. Martin, York, both of Pa., assignors to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00433, § 371 Date Apr. 5, 1982, § 102(e) Date Apr. 5, 1982, PCT Pub. No. WO83/03650, PCT Pub. Date Oct. 27, 1983

PCT Filed Apr. 5, 1982, Ser. No. 624,501

Int. Cl.³ F16J 1/08

U.S. Cl. 92—158 **4 Claims**



1. In a piston (10) having a base portion (11), a hollow open ended skirt portion (12), and a core (13) of lightweight filler material situated within the skirt portion (12), the improvement comprising:

a bore (18) formed in the base portion (11);

a tube (19) extending axially through the core (13) of filler material and having an inner end portion (21) extending into the bore (18) and including means for connecting said tube to the base portion (11);

means (22) for interlocking the tube (19) and the core (13) of filler material; and

said core (13) of filler material having an outer end surface at the open end of said skirt free from contact with all other elements of the piston.

4,519,301

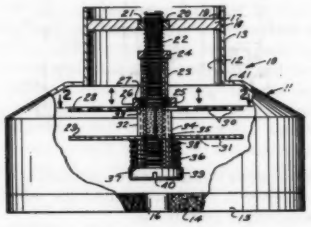
AIR FLOW BALANCING FIRE DAMPER

Lawrence E. Wetzel, 3590 Watervale Rd., Manlius, N.Y. 13104

Filed Jan. 12, 1984, Ser. No. 570,090

Int. Cl.³ E05F 15/20

U.S. Cl. 98—1 **3 Claims**



1. For use with a filter module having an air flow duct, an air flow balancing fire damper having means for closing the duct if the temperature therein exceeds a predetermined limit, the closing means comprising a support member in the duct, an elongated rod in threaded engagement with the support member, the rod depending from the support member in substantially coaxial relation to the duct, a pair of circular plate members loosely mounted on the rod in coaxial relation thereto, the plate members having air passage openings therethrough, the openings in one of the respective plate members being out of axial alignment with those of the other plate member, spring means on the rod for biasing the plate members into duct closing position, and means normally holding the plate members in spaced relation to the duct and to one another, the last-named means including fusible means that permits the spring biasing means to move the plate members into duct closing position when the duct temperature exceeds the predetermined limit, the plate members at the same time coacting to shut off the plate member air passage openings.

4,519,302

ARRANGEMENT FOR DISTRIBUTING VENTILATION AIR IN VEHICLES

Sten E. Nilsson, Vargön, and Sven E. Elfverson, Trollhättan, both of Sweden, assignors to Saab-Scania Aktiebolag, Sodertalje, Sweden

Continuation of Ser. No. 462,070, Jan. 28, 1983, abandoned, which is a continuation of Ser. No. 236,042, Feb. 20, 1981,. This application Jul. 9, 1984, Ser. No. 628,961

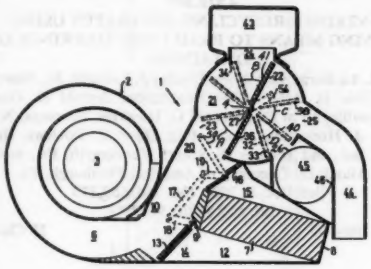
Claims priority, application Sweden, Feb. 27, 1980, 8001515

Int. Cl.³ B60H 1/00

U.S. Cl. 98—2.08 **11 Claims**

1. An arrangement for distributing ventilation air in a vehicle, comprising a ventilation housing formed with a substantially cylindrical distribution chamber having an inlet located in its cylindrical surface, and a number of outlets also located in its cylindrical mantle surface, a distributing flap extending in a longitudinal direction in said distribution chamber and being pivotable supported by said ventilation housing about a centerline of said distribution chamber, wherein said inlet and each of said outlets are arranged at different angular sectors of said distribution chamber and wherein at least three of said outlets from said distribution chamber are arranged within an angular

sector of 180° or less, each of said outlets from said distribution chamber being arranged, via separate ducts, to open out at



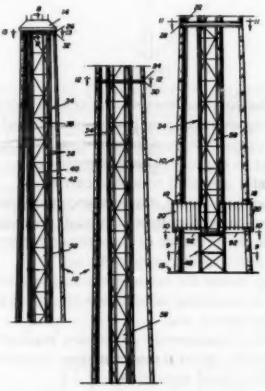
given outlet locations in a passenger compartment of the vehicle.

4,519,303

CHIMNEY LINING SYSTEM INCLUDING FRAME-SUPPORTED MEMBRANE

Randolph W. Snook, Pittsburgh, Pa., assignor to Crown Union, Inc., Pittsburgh, Pa.

Filed Mar. 24, 1983, Ser. No. 478,309
Int. Cl.³ E04H *12/28*
U.S. Cl. 98—58 **32 Claims**



1. For lining a chimney comprising a massive tubular columnar shaft, fixed upright on a foundation, a system comprising:

an upright gas-tight tubular liner made of thin, corrosion-resistant material, said liner including a plurality of axially spaced circumferential corrugations for accommodating axial expansion and contraction of the liner;

a relatively open skeletal framework that generally coaxially surrounds the liner throughout substantially the whole of the height of the liner;

generally radially extending means mechanically connecting the liner to the framework at a large plurality of axially and angularly distributed sites, these mechanically interconnecting means including means for accommodating radial expansion and contraction of said liner while preventing implosion of the liner;

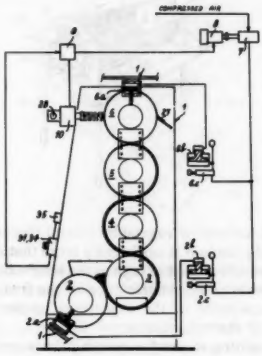
said framework being arranged to be supported at least indirectly on said foundation, to extend within the chimney column, and being so open as to permit visual inspection of the liner from externally of the framework.

4,519,304

DEVICE FOR CONTROLLING AND MONITORING THE THICKNESS OF A CHOCOLATE FILM DELIVERED BY CHOCOLATE REFINERS

Sergio Ripani, Milan, Italy, assignor to Carle & Montanari S.p.A., Milan, Italy

Filed Jan. 26, 1984, Ser. No. 574,275
Claims priority, application Italy, Apr. 21, 1983, 20718 A/83
Int. Cl.³ B02C *25/00*
U.S. Cl. 99—489 **17 Claims**



1. A device for controlling and monitoring the thickness dimension of a chocolate film in a chocolate refiner, comprising:

detector means for detecting colorimetric signals for the film being delivered;

means for converting said colorimetric signals into digitally processable signals;

means for setting electronically processable reference signals indicative of corresponding values of rated thickness dimension for the chocolate film being delivered; and

means for processing and comparing the signals processed by the colorimetric signals and the settable reference signals, said processing and comparing means being effective to generate output signals functioning as operative signals for an adjustment circuit of the side bearings of refining rollers in said chocolate refiner to produce corresponding displacement movements of said rollers to vary the thickness of the chocolate film being delivered in accordance with the preset rated thickness.

4,519,305

VEGETABLE PEELER

Dennis L. Vanosdall, Galesburg, Ill., assignor to Hawkeye Food Machinery, Inc., Galesburg, Ill.

Filed Feb. 3, 1984, Ser. No. 576,627
Int. Cl.³ A23N *7/02*
U.S. Cl. 99—625 **6 Claims**

1. A vegetable peeler for peeling large quantities of vegetables comprising:

(a) a frame;

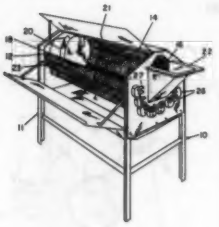
(b) a plurality of rollers rotatably attached to the frame in parallel relation to define a longitudinally extending, substantially horizontal, upwardly opening trough, the trough having sides, an intake end at which vegetables may be introduced into the trough, and a discharge end from which peeled vegetables may be discharged from the trough;

(c) roller rotating means for rotating the rollers about their longitudinal axes;

(d) a discharge auger extending longitudinally within the trough from the discharge end thereof parallel to the longitudinal axes of the rollers for a selected distance less

than the entire length of the trough, the sides of the trough extending upwardly on either side of the auger at least as high as the longitudinal axis thereof;

(e) mounting means for rotatably mounting the auger on the frame, the mounting means being adapted to leave a portion of the trough between the auger and the intake end substantially unobstructed, whereby the trough may receive an amount of vegetables placed therein for peeling, even if the amount is sufficiently large that the vegetables fill the trough at least as high as the longitudinal axis of the auger, without any interference to the free tumbling and other movement of the vegetables in the unobstructed portion of the trough; and



(f) auger rotating means for rotating the auger at a selected speed about its longitudinal axis.

4,519,306

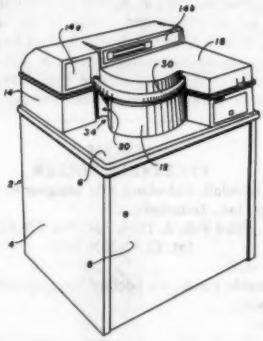
PROCESS FOR RECYCLING CONTAINERS

Robert L. LaBarge, Ben Avon; Jerrold D. Green, Murrysville; Eric D. Arndt, New Kensington; Frank J. Horansky, Apollo, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Charles J. Leftault, Jr., Murrysville, Pa.; Elmer E. Pohlenz, Richmond, Ind., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,233

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—35 **49 Claims**



1. A method for processing used containers in an apparatus, the method comprising the steps of:

(a) sensing the presence of an acceptable metal container inserted into a container receiving station in a rotatable carrier;

(b) unlocking an electromechanical latching mechanism to permit manual rotation by the user of said carrier if the presence of an acceptable container is sensed;

(c) manually rotating said carrier to convey said container to a crushing station;

(d) crushing the container in a crushing mechanism; and

(e) issuing a receipt for the crushed containers.

4,519,307

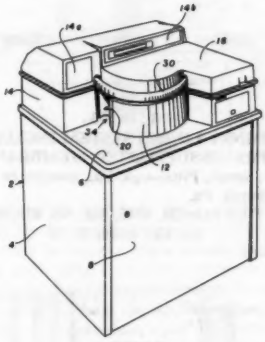
CONTAINER RECYCLING APPARATUS USING SCANNING MEANS TO READ CODE MARKINGS ON CONTAINERS

Robert L. La Barge, Ben Avon; Charles J. Leftault, Jr., Murrysville; Eric D. Arndt, New Kensington; Jerrold D. Green, Murrysville, all of Pa.; Ronald G. Hawkins, Massena, N.Y.; Frank J. Horansky, Apollo, Pa.; Elmer E. Pohlenz, Richmond, Ind., and Thomas W. Scherf, Vandergrift, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 8, 1983, Ser. No. 559,373

Int. Cl.³ B30B *9/32*

U.S. Cl. 100—99 **25 Claims**



1. Apparatus for the receipt of acceptable containers, said apparatus being characterized by the analysis and initial acceptance or rejection of a container without mechanical movement apparent to the user which comprises:

(a) a manually operated rotatable carrier;

(b) a container receiving station associated with said carrier;

(c) detecting means coupled to said receiving station to determine the presence of a container comprised of material acceptable to said apparatus;

(d) scanning means for reading markings on said container;

(e) means for recording information read from said markings on said container; and

(f) means for subsequently permitting manual actuation of said rotatable carrier if said container comprises a material acceptable to said apparatus.

4,519,308

APPARATUS FOR DISPENSING AND COMPACTING PAPER TOWELS

Kurt Eberle, Scarborough, Canada, assignor to Johann K. Heuchert, Green Bay, Wis.

Filed Dec. 1, 1983, Ser. No. 557,040

Int. Cl.³ B30B *1/04*

U.S. Cl. 100—102 **5 Claims**

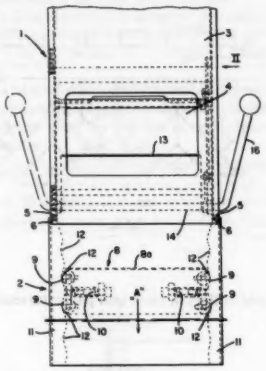
1. A combination dispenser-compactor for disposable paper products, said dispenser-compactor having a body member including a holder for unused products and a receptacle for used products,

a dispensing-opening in the holder and a receiving-opening in the receptacle,

a movable cover for the dispenser-opening and a compactor cover above the receptacle and adjacent the receiving-opening, and

an actuator operatively interconnected to said movable cover and said compactor cover

whereby an unused product will be exposed and withdrawable through the dispenser-opening and the used products



in the receptacle simultaneously will be compacted by the compactor cover when the actuator is operated.

4,519,309

SLIDING TOOL TABLE INTENDED FOR THE EXCHANGE OF TOOLS IN PRESSES

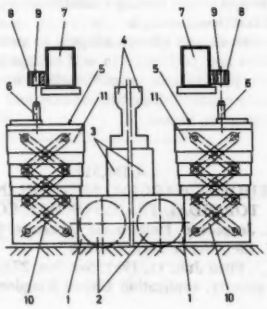
Egon Feirer, Weingarten; Ulrich Amann, and Günter Kuppinger, both of Baindt, all of Fed. Rep. of Germany, assignors to Maschinenfabrik Müller-Weingarten AG, Weingarten, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 536,036

Claims priority, application Fed. Rep. of Germany, May 7, 1983, 3316815

Int. Cl.³ B30B *15/00*

U.S. Cl. 100—229 R **5 Claims**



1. In a press comprising removable gripper rails for conveying workpieces, a sliding table, an exchangeable tool mounted on said sliding table, a gripper rail support means carried by said sliding table, the improvement comprising a raising and lowering means mounted on said table and connected to said gripper rail support means for a height level adjustment of said rail support means.

4,519,310

METHOD OF MULTI-COLOR PRINTING ON CYLINDRICAL CONTAINER

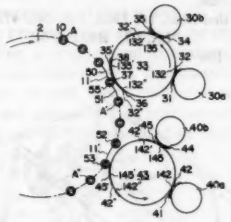
Hiromichi Shimizu; Akira Kuboshima, both of Sagamihara, and Tadashi Tanaka, Yokohama, all of Japan, assignors to Daiwa Can Company, Limited, Tokyo, Japan

Continuation of Ser. No. 258,017, Apr. 27, 1981, abandoned.

This application Sep. 14, 1983, Ser. No. 531,630

Int. Cl.³ B41F *17/00*

U.S. Cl. 101—35 **1 Claim**



1. A method of multi-color printing the side wall of a cylindrical container in which at least some of the colors overlap others comprising,

transferring a first ink formulation from a first ink ductor onto a first area of the outer periphery of a first ink form roller which first area extends in a circumferential direction of said outer periphery and the length of which is equal to the length of the outer periphery of the container side wall,

transferring a second ink formulation of a color different from and of tack value lower than that of said first ink formulation from a second ink ductor onto a second area of the outer periphery of said first ink form roller, the length of said second area being to that of the first area and said second area being immediately adjacent to said first area and extending in a circumferential direction of said outer periphery, sequentially transferring third and fourth ink formulations of colors different from each other and those of said first and second ink formulations and of successively lower tack values than said second ink formulation from at least two further ink ductors onto first and second successively arranged areas of the outer periphery of a second ink form roller and which successive areas are each of length equal to those of the areas on said first ink form roller and extend in a circumferential direction of said second ink form roller outer periphery,

positioning said container at a first printing station and while at said first printing station bringing said container side wall into press- and rolling-contact with the first area of said first ink form roller to transfer a layer of said first ink formulation to said container, while rotating it one revolution,

bringing said container side wall while said container is still at said first printing station into press- and rolling contact with said first ink form roller second area and rotating said container one revolution while it is in contact with said second area to transfer the second ink formulation to said container side wall,

moving the thus far printed container to a second printing station remote from said first station, and while at said second printing station bringing said container side wall into press- and rolling contact successively with the first and second successively arranged areas of the outer periphery of said second ink form roller while rotating said container one revolution while it is in contact with each of said last-mentioned first and second areas to transfer the respective third and fourth ink formulations to said container, whereby the inks transferred to said container side wall are applied thereto in order of descending tack value and where inks are in overlapped relationship, the over-

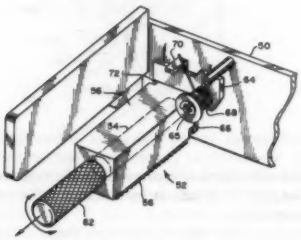
lapping ink is one having a lower tack value than the overlapped ink.

4,519,311

AUXILIARY PRINTING DEVICE FOR A POSTAGE METER

Lynnwood Lowe, Darien, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 16, 1983, Ser. No. 475,775
Int. Cl.³ B41J *1/60*
U.S. Cl. 101—109 **4 Claims**



1. In a postage meter of the flat bed printing type having a fixed printing indicia and at least one selectable value printing indicia, both said indicias being mounted on the meter frame and a reciprocating platen to apply a postal article against both said indicias so as to simultaneously print a complete postal impression; the improvement comprising:

(a) a multi-faced auxiliary printing member having additional postage identification data indicia on at least one of said faces, said member being rotatably mounted about an axis fixed in said meter frame and located adjacent said fixed indicia;

(b) detent means engagable with said printing member for aligning said indicia on said one of said faces of said printing member in a coplaner relationship with said fixed indicia after rotation thereof about said axis, said detent means further serving to retain said printing member on said axis and in said postage meter, and,

(c) a handle member attached to said multi-faced printing member to manually rotate said multi-faced printing member and select a face of said member and position said selected face in said coplaner relationship with said fixed indicia.

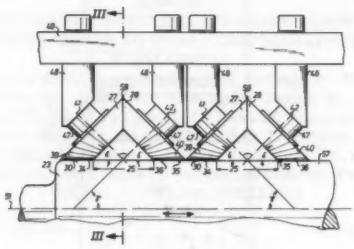
4,519,312

INKING UNIT

Claus D. Barrois, Wurzburg, Fed. Rep. of Germany, assignor to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 7, 1982, Ser. No. 366,263
Claims priority, application Fed. Rep. of Germany, Jul. 15, 1981, 3127880
Int. Cl.³ B41F *31/26, 31/10*
U.S. Cl. 101—349 **12 Claims**

1. A liquid transport mechanism for distributing a liquid medium evenly on a surface of a rotatable cylinder bearing said liquid medium; said liquid transport mechanism comprising a plurality of cooperating pairs of rotatably supported transport roller, surface portions of said rollers in each said pair contacting each other, a surface portion of each said transport roller being in contact with said surface of said cylinder, an axis of rotation of each said transport roller intersecting an axis of rotation of said cylinder at an angle of less then 90° and axes of



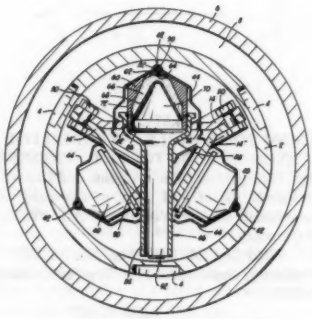
rotation of said rollers in each said pair intersecting at an angle of 90°.

4,519,313

CHARGE HOLDER

David J. Leidel, Arlington, Tex., assignor to Jet Research Center, Inc., Arlington, Tex.

Filed Mar. 21, 1984, Ser. No. 591,710
Int. Cl.³ F42B *1/02*
U.S. Cl. 102—310 **20 Claims**



1. A perforating gun for use in a well bore, comprising:

charge holder means having a substantially centered longitudinal axis therethrough;

at least one shaped charge adapted to produce a jet upon initiation and positioned in said charge holder means so that the path of said jet substantially intersects said substantially centered longitudinal axis; and

charge initiation means.

4,519,314

BOREHOLE CHARGING METHOD INCLUDING TOROIDAL TRANSFORMER CORES

Gordon K. Jorgenson, Dollard des Ormeaux, Canada, assignor to C-I-L Inc., North York, Canada

Filed Jun. 11, 1981, Ser. No. 272,487
Claims priority, application United Kingdom, Jul. 29, 1980, 8024698
Int. Cl.³ F42B *3/00*
U.S. Cl. 102—313 **4 Claims**

1. A method of charging a borehole with a column of explosives for electrically induced initiation at more than one location along the column by means of an electrically actuable detonator assembly adapted for slidable electromagnetic coupling to an energy source by means of a toroidal transformer core, which method comprises the steps of

(a) providing a length of an insulated electrical conductor in the form of a looped wire extending into and throughout the length of said borehole, a portion of said looped wire conductor extending beyond said borehole;
(b) providing a first electrically actuable detonator assembly in slidable surrounding relationship with the said insulated conductor wire by means of a coupled toroidal transformer core;
(c) providing a second electrically actuable detonator assembly in slidable surrounding relationship with the said insulated conductor wire by means of a coupled toroidal transformer core;
(d) loading a first portion of explosive material into said borehole;
(e) sliding said first detonator assembly toroid along said insulated conductor wire to a location in said borehole

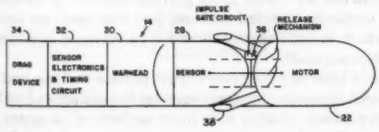
where the said detonator assembly is in initiating contact with the said first portion of explosive material;
(f) loading a second portion of explosive material into said borehole;
(g) sliding said second detonator assembly toroid along said insulated conductor wire to a location in said borehole where the said detonator assembly is in initiating contact with the said second portion of explosive material; and
(h) coupling the portion of said looped conductor wire beyond the borehole with an A.C. energy source to transmit an electric signal to said looped conductor, the said electric signal in said looped wire conductor, thereby inducing a magnetic flux within each toroid of each detonator assembly in sliding contact therewith, the said magnetic flux providing an electric signal sufficient to detonate each of said detonators.

4,519,315

FIRE AND FORGET MISSILES SYSTEM

Jerrold H. Arszman, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 20, 1982, Ser. No. 450,874
Int. Cl.³ F42B *15/00*
U.S. Cl. 102—377 **1 Claim**



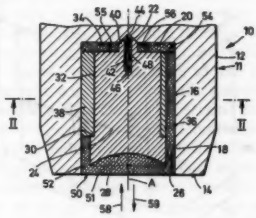
1. A light weight fire and forget weapon system comprising:
a. a shoulder held man transportable rocket launcher for launching a self forging fragment (SFF) warhead in a ballistic trajectory over a target, said launcher having a rangefinder carried thereon for determining the range to said target;
b. a missile carried in said launcher for delivering said warhead to said target, said missile including an impulse motor mounted at the forward end thereof and disposed for separation therefrom at a predetermined point in the trajectory, whereby said warhead continues in a ballistic trajectory after separation of said motor;
c. a body fixed sensor means located intermediate said motor and said warhead for detecting said target and for initiating warhead firing at a predetermined distance above said target;
d. drag spoiler means carried on the aft end of said missile and sensor electronics means carried intermediate said warhead and said drag spoiler means; and,
e. means for separating said motor and for deploying said drag device at predetermined points in the trajectory, said means including a gate circuit operatively connected through a voltage comparator and summation device to a pressure gauge in said motor, whereby responsive to actuation of said gate circuit at predetermined points in the trajectory said motor is separated and said drag device is deployed.

4,519,316

AMMUNITION, PREFERABLY FOR MACHINE CANNONS, INCLUDING A PROJECTILE EQUIPPED WITH A TRACER, WITH THE LETHAL RANGE OF THE PROJECTILE BEING LIMITED IF THE TARGET IS MISSED

Karl W. Bethmann, Gellertstrasse 15, D-4130 Moers 1, and Ulrich Theis, Kuhlendahl 92, D-4330 Mülheim/Ruhr, both of Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,324
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1981, 3146645
Int. Cl.³ F42B *11/16*
U.S. Cl. 102—513 **10 Claims**



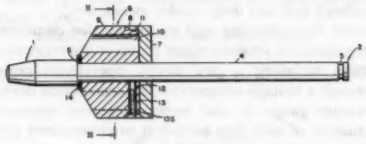
1. In ammunition, preferably for machine cannons, including a projectile, equipped with a tracer and a stabilizing element, whose lethal range is limited when the target is missed, the improvement wherein:
(a) said projectile is a subcaliber projectile;
(b) said stabilizing element is fixed with respect to said projectile by means of a body of consumable material;
(c) the consumption of said material can be timed; and
(d) said tracer is disposed adjacent said body of consumable material so that the consumption of said consumable material is caused by the heat generated by the burning of the tracer during flight of said projectile and causes said stabilizing element to change its original stabilizing position, whereby the projectile becomes ballistically unstable.

4,519,317

SUB-CALIBER PROJECTILE

Gideon Rosenberg, Kiryat Tivon, Israel, assignor to The State of Israel, Ministry of Defence, Rafael Development Authority, Tel-Aviv, Israel

Filed May 31, 1983, Ser. No. 501,069
Claims priority, application Israel, Jun. 1, 1982, 65929
Int. Cl.³ F42B *13/16*
U.S. Cl. 102—521 **3 Claims**



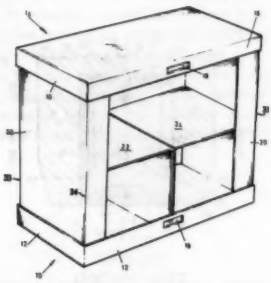
1. A sub-caliber projectile having a front end, a cylindrically shaped mid-section of substantially uniform diameter and having a substantially smooth surface and a tail end, at least the portion of the front end adjacent to said mid-section being of increased diameter with respect to the diameter of said mid-section so as to define an abutment shoulder adjacent said front end, sabot means comprising an annular stabilizing member and an annular obturating disc member, first retaining means for releasably securing said members together, said sabot means being mounted on and axially displacable as a unit along said mid-section between a first position wherein said stabilizing member abuts said abutment shoulder and a second position adjacent said tail end wherein said stabilizing member is retained and said obturating disc is axially detached therefrom, and second retaining means for retaining said stabilizing member adjacent said tail end.

4,519,318

COLLAPSIBLE SUPPORT STRUCTURES

Richard S. Weldon-Ming, 101 Waterfall Ave., Craighall, Johannesburg, Transvaal, South Africa

Filed Jan. 14, 1983, Ser. No. 458,028
Int. Cl.³ A47B *3/06, 47/00*
U.S. Cl. 108—33 **6 Claims**



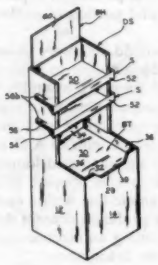
1. A collapsible table comprising a rectangular base having upstanding edges which meet to form four upstanding corners of the base, a lid having upstanding edges which meet to form four upstanding corners of the lid, the lid being arranged to form a closed box with the base when the lid and base are fitted together and the upstanding edges mate against one another, a foldable planar member arranged to fit when folded into the closed box and when unfolded to fit with opposite extreme surface regions thereof respectively against the upstanding edges and into the four corners of both the base and the lid and to support and hold the lid in a spaced parallel position relative to the base, the foldable planar member having a width corresponding to the height of the table when assembled and a length which is less than the total peripheral dimension of the assembled table, the planar member having five transverse fold lines, four of which correspond to and extend between the respective four corners of the base and lid and the fifth fold line allowing the planar member to fold intermediate its total length to enable the planar member to fit into the closed box, the planar member forming an incomplete surround for the table so that there is open access into the inside of the table, and foldable rectangular open box means having fold lines and which fits into the closed box when folded and the sides of which when unfolded lock into a rectangular form and present a cross support generally parallel to said lid and base and press against respective inside surfaces of the unfolded planar member to urge the respective extreme surface regions of the planar member towards the upstanding surfaces of the base and the lid so as to form and retain the table in its supporting configuration.

4,519,319

TUBULAR PAPERBOARD DISPLAY STAND

Robert J. Howlett, Edison, N.J., assignor to Container Corporation of America, Chicago, Ill.

Filed May 20, 1982, Ser. No. 380,078
Int. Cl.³ A47B *47/06*
U.S. Cl. 108—111 **1 Claim**



1. A collapsible display stand including a base formed of a unitary blank of foldable sheet material, such as paperboard, and comprising:

(a) pairs of opposed front and rear side wall and end wall panels foldably joined to each other to form a tubular structure;

(b) said front side wall panel and said end wall panels each having upper and lower portions separated from each other by transversely extending cut lines;

(c) said end wall panel upper portions each being divided, by a vertically disposed fold line, into front and rear sections which include aligned slots for receiving a horizontally disposed shelf;

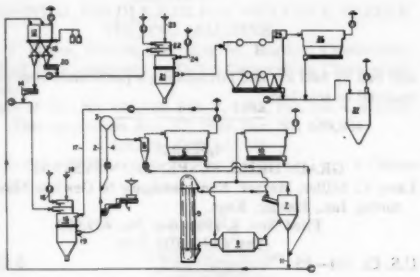
(d) said front side wall panel upper portion and said end wall panel upper portion front sections being disposed to lie in face-to-face relation with inner surfaces of an upper portion of said rear side wall panel and rear sections of upper portions of said end wall panels, respectively, to reinforce upper areas of the rear and side wall panels of said structure for support of said shelf;

(e) said shelf including upper and lower panels disposed in face-to-face relation and having corresponding front edges foldably interconnected by a pair of relatively narrow connecting flanges which form with said upper and lower panels a triangular structure.

4,519,320
DEVICE FOR BURNING A COAL-CONTAINING ASH-RICE SLUDGE

Martin Wischniewski, Krefeld, Fed. Rep. of Germany, assignor to Deutsche Babcock Anlagen Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Sep. 27, 1982, Ser. No. 424,953
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1981, 3139409
Int. Cl.³ F23G 7/04
U.S. Cl. 110—238 3 Claims

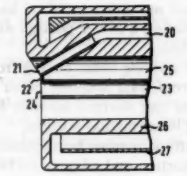


1. A device for burning waste sludge produced during a coal-gasifying process, comprising two separate gas fueled fireboxes each having an inlet for feeding-in waste sludge to be burned and an outlet for fume gases, a fume gas drier connected to the fume gas outlet of one firebox for drying waste sludge prior to its feeding into said inlets, a heat energy generator connected to the fume gas outlet of the second firebox, and means for feeding back waste gas from the heat energy generator to said second firebox.

4,519,321
BURNER FOR THE PARTIAL COMBUSTION OF SOLID FUEL

Ian Poll, The Hague, and Jacobus A. J. Smit, Amsterdam, both of Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Mar. 5, 1984, Ser. No. 586,481
Claims priority, application United Kingdom, Mar. 18, 1983, 8307520
Int. Cl.³ F23D 1/00
U.S. Cl. 110—263 12 Claims



1. Burner for the partial combustion of a finely divided solid fuel, comprising:

a central channel with a central outlet for free-oxygen containing gas;

laterally disposed conduit means for finely divided solid fuel;

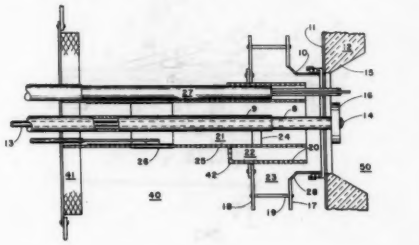
said conduit means having outlet means whose major axis is positioned to intersect the axis of the central outlet, said outlet means being asymmetrically arranged with respect to said central outlet; and

said conduit means having a diameter and disposition such that the finely divided solid fuel issuing from it penetrates into and is surrounded by a stream of free-oxygen containing gas issuing from said central channel without passing through that stream.

4,519,322
LOW PRESSURE LOSS BURNER FOR COAL-WATER SLURRY OR FUEL OIL

Gerald D. Lindstrom, N. Benton; Clifford F. Eckhart, Alliance; George A. Farthing, Jr., Homeworth; James J. Muckley, Louisville, and Brian E. Taylor, Akron, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Jun. 21, 1984, Ser. No. 622,900
Int. Cl.³ F23D 1/02
U.S. Cl. 110—264 4 Claims



1. In a boiler having wall means separating a windbox from a furnace chamber, the wall means having a frusto-conical burner port outwardly tapering therethrough from the windbox to the furnace chamber, an apparatus for burning a concentrated coal-water slurry fuel, composed of at least sixty-five weight percent of pulverized coal, comprising a coal-water fuel atomizer concentric within the burner port and fuel supply means including a burner barrel within the windbox connected with the atomizer, an outer cylindrical casing concentric with and radially spaced from the fuel supply means and having one end mounted to the wall means on the windbox side, a cylindrical sleeve surrounding and radially spaced from the fuel supply means to define an inner annulus therebetween, said sleeve having an end opening within the casing proximate to and axially spaced from the burner port, said sleeve including means for passing air therethrough to the inner annulus from the window, a cylindrical housing concentrically mounted about at least part of the sleeve intermediate and radially spaced from the sleeve and the casing to define an outer annulus between the housing and the casing, said cylindrical housing having a first end open proximate to and axially spaced from the burner port, a second end axially spaced remote from the burner port and a plate closing the second end, said casing having a series of openings at circumferentially-spaced intervals in its periphery radially aligned with the housing adapted to supply air from the windbox to the outer annulus, a plurality of cuvilinear vanes, each of said vanes movably mounted in a respective one of the openings to regulate air passage therethrough, each of said vanes having an offset end circumferentially overlapping and radially spaced from an opposite end of an adjacent one of said vanes.

4,519,323
VELOCITY CONTROLLING APPARATUS AND METHOD TO BE USED WITH A STOKER TYPE BURNING APPARATUS

Osamu Takano, Suita, and Koji Fujiwara, Yamatokooriyama, both of Japan, assignors to Kabushiki Kaisha Takuma, Osaka, Japan

Filed Mar. 26, 1984, Ser. No. 593,079
Claims priority, application Japan, Apr. 1, 1983, 58-58199
Int. Cl.³ F23H 7/08
U.S. Cl. 110—281 1 Claim

1. A velocity controlling apparatus to be used with stoker

type burning apparatus on a refuse incinerator wherein refuse to be burned is moved forwardly by repeated reciprocating (forward and backward) motion of movable fire grates, said apparatus comprising:

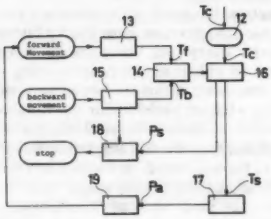
a time counter measuring time Tf of forward movement of the movable fire grates;

a time counter measuring time Tb of backward movement of the movable fire grates;

a grates-stopping apparatus which stops the movable fire grates;

a time adding machine which adds up time Tf of forward movement of the movable fire grates and time Tb of the backward movement of the same;

a standard-speed setting apparatus which sets a standard



cycle time Tc necessary for the movable fire grates to complete one cycle of the reciprocating motion, with the standard cycle time Tc being calculated on the basis of a predetermined frequency of the reciprocating motion of the fire grates;

a comparing apparatus which compares between the added-up time (Tf+Tb) and the standard cycle time Tc to calculate the time difference Ts between them;

a time counter which receives a signal representative of the time difference Ts and measures the stop time of the movable fire grates, said time counter issuing a signal Pa activating the movable fire grates when the stop time equals the said time difference Ts, and;

a grates-activating apparatus which receives the signal Pa and moves the movable fire grates to begin another cycle.

4,519,324

GAS INJECTION METHOD FOR IMPROVING THE OPERATION OF A FLUIDIZED BED REACTOR

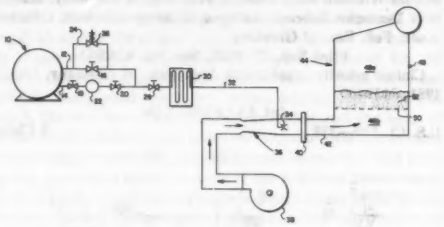
Dennis A. Toth, Lake Hopatcong, N.J., assignor to Foster Wheeler Energy Corporation, Livingston, N.J.

Filed Aug. 23, 1984, Ser. No. 643,525

Int. Cl.³ F23D *1/00*

U.S. Cl. 110—347 **3 Claims**

1. A method of operating a fluidized bed comprising the steps of forming a bed of relatively soft adsorbent material for adsorbing sulfur produced as a result of the combustion of a combustible material, introducing air into said bed to fluidize said soft material, injecting a gaseous agent into said bed to increase the surface hardness of said adsorbent material and prevent the latter from degrading and being carried away from



said bed by said air, and introducing a particulate combustible material to said bed.

4,519,325

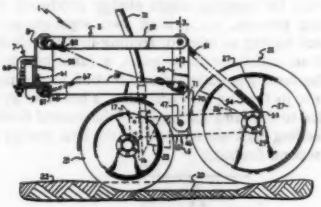
GRAIN DRILL SUSPENSION SYSTEM

Larry C. Miller, Harper, Kans., assignor to DewEze Manufacturing, Inc., Harper, Kans.

Filed Nov. 8, 1982, Ser. No. 439,999

Int. Cl.³ A01C *5/00*

U.S. Cl. 111—85 **3 Claims**



1. A grain drill suspension system adapted to be attached to a prime mover for transferring a seed planter employing said suspension system across a field, said suspension comprising:

(a) a mounting bracket for attaching said suspension system to the prime mover;

(b) a parallel link structure attached to said mounting bracket and having parallel front and rear vertical members and parallel upper and lower cross links pivotally connected at extremities thereof to said front and rear vertical members; said front vertical member being attached to said mounting bracket; and said rear vertical member including a lower portion extending below said lower cross link;

(c) an elongate walking beam having front, rear and medial portions thereof; said walking beam being pivotally attached to said rear vertical member lower portion along said walking beam medial portion;

(d) a furrow cutting member being mounted on said walking beam front portion and adapted to be engageable with a soil surface for cutting a furrow therein;

(e) a furrow closing member being mounted on said walking beam rear portion and adapted to be engageable with the furrow for closing and packing same;

(f) a seed depositing member being retained between said furrow cutting and furrow closing members and adapted to deposit a succession of seeds into the furrow;

(g) said upper and lower cross links comprising respective horizontally spaced pairs of upper and lower cross links; and means spacing said pairs of links sufficiently to allow said furrow cutting member to translate upwardly therebetween; and

(h) a stop plate being attached to and extending upwardly

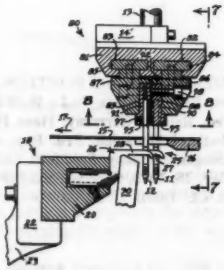
from said walking beam medial portion; said stop plate engaging said parallel link structure at the pivotal connection between said rear vertical member and said pair of lower cross links upon rotation of said walking beam relative to said vertical member when said furrow cutting member is being urged downwardly so as to limit pivotal movement of said walking beam relative to said parallel link structure, thereby limiting to a controlled depth of the furrow cut by said furrow cutting member.

4,519,326

SEGMENTAL NEEDLE BAR FOR MULTIPLE NEEDLE TUFTING MACHINE

Jerry T. Green, Hixson, and Max M. Beasley, Chattanooga, both of Tenn., assignors to Tuftco Corporation, Chattanooga, Tenn.

Division of Ser. No. 464,410, Feb. 7, 1983, Pat. No. 4,483,261. This application Aug. 13, 1984, Ser. No. 639,804
Int. Cl.³ D05C *15/00*
U.S. Cl. 112—79 R 5 Claims



1. In a multiple needle tufting machine having a plurality of uniform needles, each needle having a pointed end portion and a shank adjacent its opposite end portion, and a needle drive member, a needle bar assembly comprising:

(a) an elongated needle mounting bar member comprising a pair of needle bars of predetermined length connected to the needle drive member for reciprocable movement in a stitching direction,

(b) a needle bar holder,

(c) means slideably mounting said needle bars in said needle bar holder for independent slideable movement longitudinally of said needle bars,

(d) a pair of sets of elongated needle bar segments, each set comprising a plurality of elongated needle bar segments, each segment being of a length substantially less than the length of said mounting bar member,

(e) each needle bar segment having a plurality of elongated needle holes therethrough having parallel longitudinal axes, each needle hole being adapted to coaxially receive the shank of a needle,

(f) needle securing means for holding a needle in a corresponding needle hole,

(g) said mounting bar member and each of said needle bar segments comprising overlapping portions,

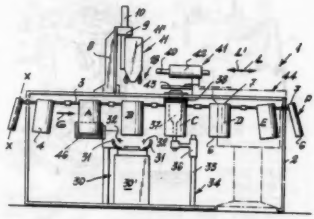
(h) bolt means connecting the overlapping portions of one set of needle bar segments to one of said needle bars and connecting the overlapping portions of said other set of needle bar segments to the other of said needle bars, the needle bar segments in each set being arranged end-to-end along said mounting bar member so that the longitudinal axes of said needle holes are parallel to said stitching direction.

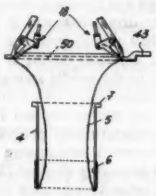
4,519,327

TRANSFER MACHINE FOR OVERTURNING A TEXTILE TUBULAR ELEMENT FOR THE SEWING OF THE EDGES THEREOF AND FOR THE SUBSEQUENT RE-OVERTURNING AND DISCHARGING

Fabio Selvi, Via Delle Massucce 12, 50020 La Romola (Firenze), Italy

Filed Mar. 12, 1984, Ser. No. 588,249
Claims priority, application Italy, Mar. 11, 1983, 20035 A/83
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.15 7 Claims





1. A transfer machine for overturning a textile tubular element for the sewing of the edges thereof and for the subsequent re-overturning and discharging comprising:

a plurality of hollow shaped bodies having substantially elliptical cross-section and a lower and an upper edge;

drive means for the intermittent and unidirectional advancement of said bodies along a predetermined path, to each dwell of a considered body corresponding a station;

a first of said stations being a station for the threading on the outer surface of on considered body of a tubular element with an end portion thereof projecting beyond said lower edge;

a second of said stations having tucking means disposed below said path for tucking said projecting portion about the lower edge of the considered body and gripping means disposed above said path and aligned with said tucking means for gripping the tucked end portion to overturn said tubular element;

a third of said stations having levelling means disposed below said path for levelling the upper edges of said overturned tubular element;

transfer and gripping means disposed above said path moving along with a considered body and associated overturned tubular element from said second to said third station and from there to a fourth station having conventional sewing means; and

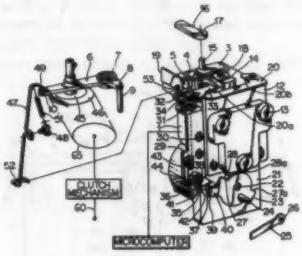
a fifth of said stations having means for re-overturning said overturned tubular elements and for removing it from said considered body.

4,519,328

ELECTRONIC SEWING MACHINE WITH CONTROL DETECTING DEVICE

Hideaki Takenoya, and Eiichi Shomura, both of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,985
Claims priority, application Japan, Jun. 16, 1981, 56-91564
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 E **4 Claims**



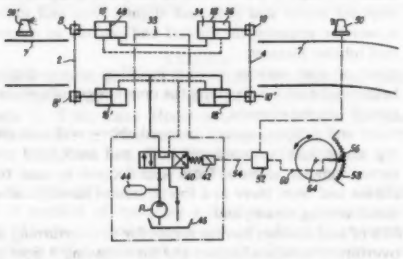
1. In a sewing machine comprising stitch forming instrumentalities, a needle swinging device and a fabric feed regulator, a motor-driven belt wheel, a drive shaft arranged in the sewing machine, clutch means interconnected between the belt wheel and the drive shaft and operated in one direction to connect the belt wheel to the drive shaft and in the opposite direction to disconnect the belt wheel from the drive shaft; at least two pulse motors (**1**, **21**) each having a control shaft and operatively connected to the needle swinging device and the fabric feed regulator, respectively to control the stitch forming instrumentalities; and microcomputer means operated in accordance with a predetermined program to control the pulse motors, an improvement comprising a first screening element (**4**) and a second screening element (**33**) each operated in association with the respective control shaft of the two pulse motors (**1**, **21**); and a single photoelectric sensor means (**5**) adapted to cooperate with said first screening element and said second screening element at predetermined anngular positions taken by the respective control shafts of the respective pulse motors to thereby produce a plurality of electric signals for operating the microcomputer means to set each of the pulse motors to an initial position.

4,519,329

BOGIE WITH ORIENTABLE AXLES FOR RAILROAD VEHICLES

Pierre Vacher, Paris, France, assignor to A.N.F. Industrie, France

Filed Jul. 25, 1983, Ser. No. 516,953
Claims priority, application France, Jul. 26, 1982, 82 12992
Int. Cl.³ B61F *5/30*
U.S. Cl. 105—218 A **18 Claims**



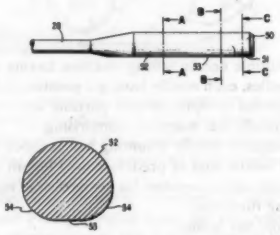
1. A bogie for a railroad vehicle of the type comprising a bogie frame and two axles coupled to the frame by means of resilient primary suspension elements and by means of substantially horizontal link-arms, one end of each link-arm being pivotally attached to the bogie frame and the other end being attached to one axle-box, wherein at least one link-arm of each axle is a variable-length controlled telescopic arm constituted by a double-acting hydraulic jack, one of the jack elements such as the piston or cylinder being coupled to the bogie frame and the other jack element being coupled to the axle-box, wherein said bogie comprises a hydraulic circuit provided with switching means for selectively establishing the supply, draining and isolation of the two jack chambers, wherein said bogie comprises control means which come into action in response to the curves of the track on which the bogie is running, and wherein each hydraulic jack is provided with a releasable locking mechanism for locking said jack in the mean position.

4,519,330

SEWING NEEDLE WITH TWO PORTION SHANK

Thaddeus J. Zylbert, Morris Plains, N.J.; Wolf-Dieter Fuhrmann, Aachen, Fed. Rep. of Germany; Hans Hammer, and Fritz Kappertz, both of Wurselen, Fed. Rep. of Germany, assignors to The Singer Company, Stamford, Conn.

Filed Dec. 28, 1983, Ser. No. 566,249
Int. Cl.³ D05B *55/02, 85/00*
U.S. Cl. 112—222 **5 Claims**

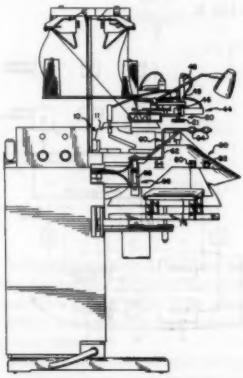


1. A needle for use with a sewing machine having a one way needle clamp of the type having a needle shank accommodating recess with a mouth shaped to admit a given irregular shaped needle shank in only one orientation, and means within said recess for locating a reference surface on said needle shank in a predetermined plane with respect to said sewing machine, said needle having a blade extending parallel to the lengthwise axis of said needle, an enlarged shank including a minor portion adjacent the free extremity thereof and a major portion extending from the blade and formed with a flat planar reference surface for cooperation with said locating means in said needle clamp, only said minor portion being formed with with said given irregular shape for cooperation with said needle clamp mouth to admit said needle into said needle clamp recess in only one orientation, in which said flat planar reference surface along said major portion of said shank extends into said given irregular shape in said minor portion at the free extremity of said shank, and said given irregular shape further includes protrusions formed at each side of said flat, said protrusions substantially extending the width of said flat in said minor portion as compared with the width of said flat along said major shank portion.

4,519,331
APPARATUS FOR TRANSFERING AND STACKING SHORT WORKPIECE PANELS

Robert L. Kosrow, Hoffmann Estates, and Robert C. Talsma, Glen Ellyn, both of Ill., assignors to Union Special Corporation, Chicago, Ill.

Filed Apr. 25, 1984, Ser. No. 603,878
Int. Cl.³ D05B *33/00*
U.S. Cl. 112—262.3 18 Claims



1. A method of serging divergent edges of a workpiece with an automatic apparatus including an automatically controlled sewing machine having a work supporting surface, a stacking apparatus, said method comprising the steps of:

automatically serging the edges of the workpiece with said sewing machine;

moving the stacking apparatus to a first position to receive the serged workpiece from the work supporting surface of the machine prior to completion of the serging operation;

holding the serged workpiece against the stacking apparatus;

moving the stacking apparatus to a second position while simultaneously positioning the workpiece relative to the stacking apparatus; and

releasing the workpiece from the stacking apparatus.

3. In combination with a pedestal mounted overedge sewing machine having a work supporting surface and stitch forming instrumentalities adapted to operate along at least three sides of a workpiece, a control system for sequentially operating said sewing machine and a stacking device comprising:

stacker means pivotally arranged on said pedestal and responsive to said control system for transferring a workpiece received from the work supporting surface of the machine to a predetermined position whereat said workpiece is deposited; and

means operatively associated with said stacker means for orientating the workpiece in a predetermined disposition relative to the stacker means during its transferance to said predetermined position.

4,519,332
METHOD FOR CONTROLLING A TUFTING MACHINE

Tsutomu Fukuda, Kakogawa-shi, Hyogo-ken, Japan

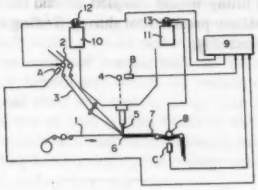
Filed Dec. 12, 1983, Ser. No. 560,393
Int. Cl.³ D05C *15/20*
U.S. Cl. 112—266.2 2 Claims

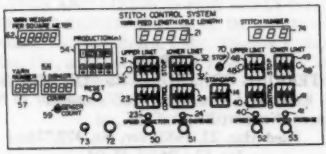
1. A method for controlling a tufting machine utilized for manufacturing a tufted carpet by stitching yarns supplied by a yarn feed roller onto a ground fabric supplied by a spiked roller by means of needles; comprising:

pre-establishing a standard supply length of a ground fabric and a standard yarn feed length, each for a predetermined unit stitch number;

determining an actual supply length of the ground fabric and an actual yarn feed length, each for a unit stitch number by means of measured values respectively obtained from a ground fabric supply detector, a yarn feed detector, and a stitch number detector;

comparing the measured values with the standard values; and



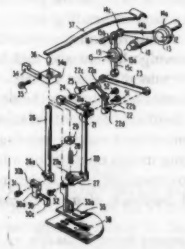


automatically controlling the rotational speeds of the spiked roller and/or the yarn feed roller, respectively, to correct the supply rate of the ground fabric and/or the yarn to the standard values when the measured values exceed upper or lower limit of a predetermined allowable range for each of the standard values.

4,519,333
AUXILIARY PRESSER FOOT FOR ENGAGING A PREVIOUSLY FORMED STITCH

Fumio Minakuchi, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Japan

Filed Jan. 13, 1983, Ser. No. 457,603
Claims priority, application Japan, Jan. 13, 1982, 57-003888
Int. Cl.³ D05B *27/04*
U.S. Cl. 112—311 4 Claims



1. In a sewing machine having a frame supporting stitch-forming means, a drive mechanism, an apertured throat plate, a presser bar mounted above said throat plate for vertical reciprocating movement only, a presser foot secured to lower end of said presser bar, a feed dog located below said throat plate adapted to be oscillated through said apertured throat plate by said drive mechanism for feeding a workpiece past said stitch-forming means and a needle-thread tensioning lever, the improvement comprising an auxiliary presser foot device comprising an auxiliary presser bar mounted in said frame rearwardly of said presser bar in the direction of feed of said

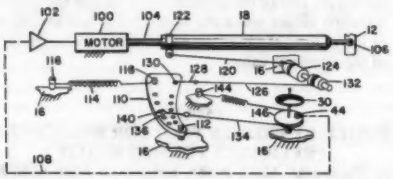
workpiece for vertical reciprocating movement only, an auxiliary presser foot secured to lower end of said auxiliary presser bar adapted to engage and press previously formed stitches in said workpiece against said throat plate during tensioning of a newly formed stitch, biasing means for urging said auxiliary presser bar and said auxiliary presser foot in the downward direction, and lifting means coupled to said drive means for lifting said auxiliary presser foot during feeding of said workpiece by said feed dog.

4,519,334

STEERING CONTROLLERS FOR BOATS

Giltner J. Knudson, Costa Mesa, Calif., assignor to Nancy K. Hutchinson, Newport Beach, Calif.

Filed Mar. 22, 1983, Ser. No. 477,774
Int. Cl.³ B63H *25/04*
U.S. Cl. 114—144 R **2 Claims**



1. For connection to a boat rudder:

a rudder moving element;

heading error signal generating means including a feedback element movable in proportion to movement of said rudder moving element position for providing a signal indicative of the direction of heading error;

steering control means responsive to said signal for moving said rudder moving element and said feedback element in directions determined by said signal;

scale changing means for adjusting the degree of such movement of said feedback element relative to the degree of such movement of said rudder moving element;

said scale changing means comprising a lever movable as an incident to movement of said rudder moving element and to which said feedback element is connected for movement;

said feedback element being rotatable and including a rotatable drive element, said scale changing means comprising a cable having connection to a point on said lever and extending over said drive element whereby said feedback element is rotated as an incident to movement of said lever; and

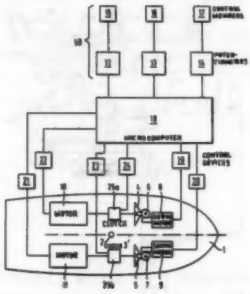
further comprising a spring connected to said lever to tend to bias the lever to rotation in one direction and means in the form of a cable interconnecting said rudder moving element and said lever on a selected point on said lever for moving the lever in opposition to said bias, and in yielding to said bias, in a degree that is proportional to movement of said rudder moving element.

4,519,335

DEVICE FOR CONTROLLING THE DIRECTION OF MOVEMENT AND THRUST FORCE OF A WATERCRAFT

Franz Krautkremer; Siegfried Lais, both of Spay; Reinhold Knecht, Rhens, and Detlev Stache, Waldesch, all of Fed. Rep. of Germany, assignors to Schottel-Werft Josef Becker GmbH & Co KG., Spay, Fed. Rep. of Germany

Filed Jun. 10, 1983, Ser. No. 503,204
Claims priority, application Fed. Rep. of Germany, Jun. 11, 1982, 3222054
Int. Cl.³ B63H *25/42*
U.S. Cl. 114—144 R **18 Claims**



1. A device for controlling the direction of movement and the force in such direction for a watercraft, comprising two thrust generating devices, drive means for driving said thrust generating devices, and an input device which can control rotation of the watercraft about a vertical axis, linear movement of the watercraft in horizontal directions, and the thrust force produced by said thrust generating devices for effecting said rotational and linear movements; wherein said input device includes a first input element for defining the force for linear movement of the watercraft and a second input element for defining the direction of linear movement of the watercraft; wherein said first and second input elements are each controlled by a respective control member; wherein said control member for said second input element is a head which can be pivoted about a stationary first axis and operates said second input element through a first gear arrangement; wherein said control member for said first input element is a lever which is pivotally supported on said head for movement about a second axis which extends at a right angle to said first axis, said lever being operatively connected by a second gear arrangement to a longitudinally movably supported rack which operates said first input element through a pinion; and including a handwheel which is supported for rotation about a third axis and is operatively connected by a third gear arrangement to a third input element.

4,519,336

REAR EXTENSION FOR BOAT HULL

David A. Mason, 48 Maple Ave., Smiths Falls, Ontario, Canada K7A 2A5

Filed Aug. 23, 1983, Ser. No. 526,020
Claims priority, application Canada, Jun. 14, 1983, 430331
Int. Cl.³ B63B *1/22*
U.S. Cl. 114—286 **9 Claims**

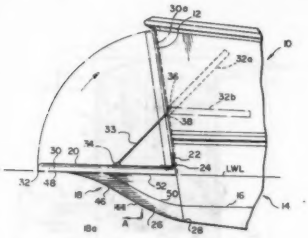
1. A hull extension attachment for the transom of a boat, said attachment comprising:

a hollow body;

said hollow body defining a substantially flat top surface, a forward end and a bottom surface, and shape to form a continuous rearward extension, beyond the transom, of the shape of a bottom portion of the hull of said boat;

means for pivotally connecting a forward edge of said top surface to the transom; and

means connectible to said hollow body and said boat for pivoting said hollow body about said pivot means between (1) a lowermost position, in which said forward end of said hollow body is in face-to-face abutment with said transom from the bottom of said transom at least to the waterline of said boat, and in which a forward edge of said hollow body bottom surfacce is disposed adjacent and in



alignment with said boat hull bottom surface and said hollow body top surface projects horizontally from said transom, and (2) a raised portion in which said hollow body top surface is disposed at least substantially adjacent and facing said transom;

said bottom surface of said hollow body being upwardly and rearwardly inclined from the remainder of said boat hull bottom surface to establish substantially laminar water flow when said hollow body is in its lowermost position.

4,519,337

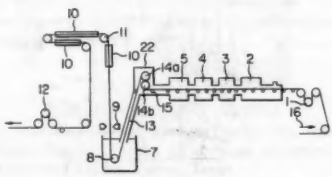
APPARATUS FOR CONTINUOUS HOT DIPPING OF METAL STRIP

Yoshio Ono, and Takashi Tanaka, both of Osaka, Japan, assignors to Nisshin Steel Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 97,550, Nov. 26, 1979, abandoned. This application Sep. 14, 1981, Ser. No. 301,805

Int. Cl.³ B05C *3/152, 11/00, 11/06*

U.S. Cl. 118—33 **1 Claim**



1. An apparatus for continuous hot dipping of metal strip comprising:

pre-treatment furnaces;

a dipping bath downstream of said pre-treatment furnaces;

air wiping nozzles adjacent the exit from said dipping bath for regulating the amount of molten metal adhering to a strip being dipped;

means for passing metal strip through said pre-treatment furnaces and dipping bath and past said nozzles, said means including tension roll means at the entrance of said pre-treatment furnaces and downstream of said nozzles;

tension control roll means comprising bridle rolls having driving motors for driving them, said bridle rolls being disposed downstream of said pre-treatment furnaces and upstream of said dipping bath for controlling the tension in said pre-treatment furnaces separately from the tension between said bridle rolls and said tension rolls downstream of said nozzles, said bridle rolls having shafts and bearings for said shafts and sealing boxes around said bearings;

a housing around said bridle rolls in communication with said pre-treatment furnace, the shafts of said bridle rolls extending through the opposite sides of said housing, said sealing boxes being on said housing covering the points at which said shafts extend through said housing, water jackets on said housing at said points, said bearings for each shaft being on said water jackets with said water jacket between said bearing and said housing, said bearings each having seal means for sealing the passage between said shaft and said housing, each shaft extending through one of said sealing boxes to the corresponding driving motor, and seal means between each shaft and said one sealing box for sealing the passage between said shafts and said sealing box; and

means for supplying an inert gas to said sealing boxes.

4,519,338

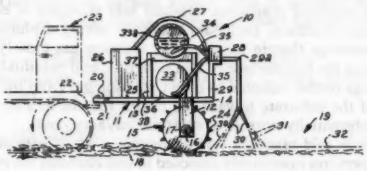
APPARATUS AND METHOD FOR APPLYING A FOAM LAYER TO COVER AND SEAL DUMPED WASTE

Fritz Kramer, Newport Beach, Calif.; Thomas E. Skornscheck, Brandon, Fla., and Ernest Strauss, Florence, S.C., assignors to Sanifoam, Inc., Costa Mesa, Calif.

Filed Oct. 20, 1983, Ser. No. 543,933

Int. Cl.³ B05B *13/00*

U.S. Cl. 118—305 **10 Claims**



1. Apparatus for the spraying of hardenable plastic foam for the covering and sealing of dumped waste comprising a compacting wheel, said compacting wheel adapted to be tracked over dumped waste, said compacting wheel wider than the tracks of a tractor vehicle adapted to track said wheel, hardenable foam generating means, yoke means, a plurality of nozzles extending from said yoke means, said foam generating means and yoke means and said nozzles adapted to track with said wheel, said nozzles alternatingly extending downwardly on said yoke means at an angle away from a vertical plane and juxtaposed to said compacting wheel, said hardenable plastic foam generating means adapted to deliver said foam at high velocity to said nozzles to adhere to said waste, and said nozzles adapted to spray a swath at least the width of said compacting wheel over waste computed by said wheel.

4,519,339

CONTINUOUS AMORPHOUS SOLAR CELL PRODUCTION SYSTEM

Masatsugu Izu, Birmingham; Vincent D. Cannella, Detroit, and Stanford R. Ovshinsky, Bloomfield Hills, all of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

Division of Ser. No. 240,493, Mar. 16, 1981, Pat. No. 4,410,558, which is a continuation-in-part of Ser. No. 151,301, May 10, 1980, Pat. No. 4,400,409. This application Jan. 19, 1982, Ser. No. 340,630

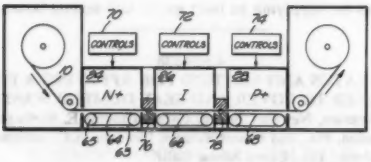
Int. Cl.³ C23C *17/00*

U.S. Cl. 118—718 **8 Claims**

1. A system for the production of semiconductor devices on the first surface of an elongated substrate, said system comprising:

a. at least first and second dedicated isolated deposition chambers having an electrode therein;

b. means for sequentially supplying said substrate into each of said deposition chambers;
c. supply means for providing a continuous flow of reaction gas including a semiconductor material across the first surface of said substrate;
d. power supply means operatively connected to the electrodes in said deposition chambers for causing a glow discharge plasma in the reaction gas for the deposition of semiconductor material in each of said chambers onto the first surface of said substrate;
e. means for providing a flow of gas to substantially isolate the reaction gas in each of the deposition chambers from the reaction gas in the adjacent chambers;
f. means for exhausting reaction gas from each of the chambers, whereby a layer of amorphous semiconductor mate-



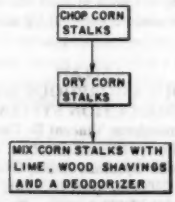
rial is sequentially deposited onto the first surface of the substrate in each of the deposition chambers for producing a semiconductor device;
g. a manifold positioned adjacent said substrate in each of said chambers, each said manifold having a plurality of openings therein for directing reaction gas closely adjacent the first surface of said substrate; said manifold openings further adapted to direct reaction gas from the edges of the substrate toward the center thereof in a direction substantially normal to substrate advance; and
h. each said manifold further having a set of exhaust port apertures operatively disposed in said chamber for providing an equilibrium flow of fresh reaction gas to said substrate and withdrawal of spent reaction gas from said substrate.

4,519,340

ABSORBENT COMPOSITION FOR ANIMAL EXCRETA AND PROCESS FOR MAKING AND USING SAME

Patricia C. Dickey, Long Lake, Minn., assignor to Dickey Natural Systems, Inc., Hamel, Minn.

Continuation-in-part of Ser. No. 359,151, Mar. 17, 1982, abandoned. This application Feb. 28, 1984, Ser. No. 584,489
Int. Cl.³ A01K *1/015*
U.S. Cl. 119—1 **10 Claims**



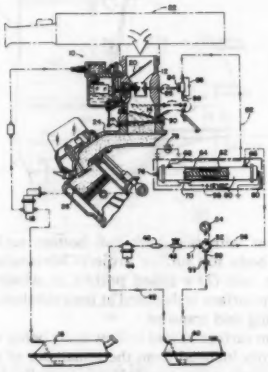
1. An absorbent composition comprising chopped corn stalks having a moisture level by weight less than 20%, lime, and an organic substance cut to be no larger than said corn stalks and having a density greater than said corn stalks, said organic substance for adding weight to said chopped corn stalks for said composition, said corn stalks comprising at least 50% by weight of said composition, said corn stalks being chopped into a distribution of lengths averaging between 13 and 38 millimeters.

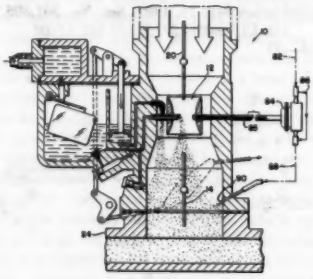
4,519,341

HEATED WATER-ALCOHOL INJECTION SYSTEM FOR CARBURETED INTERNAL COMBUSTION ENGINES

Clarence D. McGarr, 6018 - 133rd Ave., NE., Lake Stevens, Wash. 98258

Filed Aug. 5, 1982, Ser. No. 405,598
Int. Cl.³ F02D *19/00*
U.S. Cl. 123—1 A **20 Claims**





1. In a gasoline burning internal combustion engine having a carbureted fuel intake system, a heated water-alcohol injection system comprising:
means for storing a mixture comprising liquid water and alcohol,
means for electrically heating the mixture to a gaseous state;
pump means in combination with fluid conduit means to convey the mixture from the mixture storing means to the heating means;
backflow vent means connecting a point in the fluid conduit means intermediate the pump means and the heating means to the storage means; and
means to controllably deliver the heated mixture from the heating means to the fuel intake system of the engine.

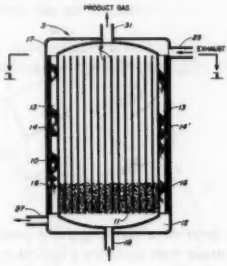
4,519,342
ALCOHOL DISSOCIATION REACTOR FOR MOTOR VEHICLES

Heeyoung Yoon, McMurray, Pa., assignor to Conco Inc., Wilmington, Del.

Continuation-in-part of Ser. No. 414,744, Sep. 3, 1982, Pat. No. 4,444,158. This application Mar. 23, 1984, Ser. No. 624,360

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—3 **3 Claims**



1. A reactor for providing fuel vapor to and for treating exhaust gases from an internal combustion engine, which reactor comprises:

(a) elongated reaction chamber means having inlet and outlet means disposed at substantially opposed ends of said chamber means,

(b) a plurality of longitudinal fins on the interior wall of said chamber means,

(c) a mass of particulate dissociation catalyst arranged within said chamber means and in heat exchange contact with said fins,

(d) means for supplying methanol to said inlet means, and means for conveying gaseous dissociation product from said outlet means to the fuel intake of said engine,

(e) housing means surrounding said chamber means and having a gas supply opening and a gas discharge opening, said openings being disposed in substantially opposed faces of said housing means, and

(f) means for conveying exhaust gas from said engine to said gas supply opening.

4,519,343
ENGINE COOLING SYSTEM

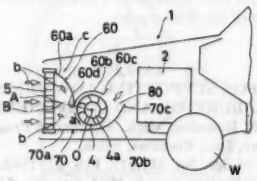
Masaharu Hayashi, Toyota; Syunzo Tsuchikawa, Ichinomiya, and Masato Itakura, Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 2, 1983, Ser. No. 548,098

Claims priority, application Japan, Nov. 8, 1982, 57-195628; Nov. 8, 1982, 57-168975[U]; Nov. 8, 1982, 57-168976[U]

Int. Cl.³ F01P *5/06*

U.S. Cl. 123—41.49 **10 Claims**



1. An engine cooling system for an automotive vehicle including a vehicle body, comprising:

(a) a radiator adapted to be mounted on the vehicle body;

(b) a cross-flow fan disposed behind said radiator and having a shaft;

(c) a casing assembly connected to said radiator and including an upper casing disposed above said cross-flow fan, a lower casing disposed below said cross-flow fan, and a pair of lateral casings disposed one on each side of said cross-flow fan; and

(d) a motor connected to one end of said shaft for driving said cross-flow fan to create an air flow through said radiator and said casing assembly,

wherein said upper casing includes a first curved portion extending from an upper end of said radiator, a second curved portion extending from said first curved portion in partly covering relation to said corss-flow fan, and a third end portion extending from said second curved portion, said first and second curved portions being joined by a downwardly projecting edge located on a straight line connecting between a vertically central point on said radiator and an axis of said shaft of said cross-flow fan, said lower casing including a first straight portion extending from a lower end of said radiator, a second curved portion extending from said first straight portion, and a third end portion extending from said second curved portion, said third end portions of said upper and lower casings jointly constituting an air flow outlet.

4,519,344
V-TYPE INTERNAL COMBUSTION ENGINE

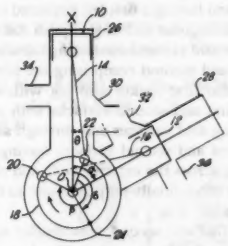
Kazuo Ohyama, and Takashi Kitami, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 440,031

Claims priority, application Japan, Nov. 7, 1981, 56-177831; Nov. 7, 1981, 56-177832

Int. Cl.³ F02B *75/06*

U.S. Cl. 123—55 VF **1 Claim**



1. An engine comprising

at least one pair of cylinders including a first cylinder and a second cylinder, each said pair of cylinders being arranged in a V having an included angle α;

a crank including at least a pair of nonaligned crankpins, a first crankpin of each said pair being positioned and arranged for use with said first cylinder and a second crankpin of each said pair being positioned and arranged for use with said second cylinder, said second crankpin being arranged on said crank at an angle β from said first crankpin as measured in a first direction about said crank substantially equal to 180 less than twice said included angle α of said pair of cylinders;

a reciprocating mass including a piston and connecting rod for each of said cylinders and crankpins, each said connecting rod being connected at a first end to said piston and at a second end to said crankpin for each of sayd cylinders;

a balance weight attached to said crank, said balance weight being attached at a balance angle δ measured in said first direction about said crank from said first crankpin whose tangent is substantially equal to U/V where

$$U=1+\cos(\beta-\alpha)\cos\alpha-\sin(\beta-\alpha)\sin$$

$$V=\cos(\beta-\alpha)\sin\alpha+\sin(\beta-\alpha)\cos\alpha,$$

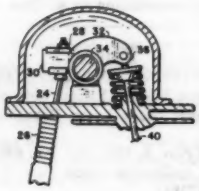
said balance weight being mounted at an equivalent radius to said crankpins and being equal in weight to substantially one-half the weight of one of said reciprocating masses multiplied by the square root of the sum of the squares of U and V.

4,519,345

ADJUSTABLE RATIO ROCKER ARM

Bob Walter, 19361 Lake Chabot Rd., Castro Valley, Calif. 94546

Filed Mar. 5, 1984, Ser. No. 586,231
Int. Cl.³ F01L *1/18*
U.S. Cl. 123—90.16 **2 Claims**



1. A method for altering the amount of valve lift in apparatus employing a cam actuated push rod, a rocker arm rotational about an axis and having a first leg displaced on one side of said axis and contacting one end of said push rod and a second leg displaced from said axis and contacting the stem end of a spring biased valve, said method comprising the steps of:

providing said first rocker arm leg with substantially flat, parallel first and second surfaces with an elongated slot intersecting said surfaces and through said first leg, each of said first and second surfaces having a projecting lip extending across the exterior end, said slot being aligned on an axis substantially perpendicular to the rotational axis of said rocker arm;

positioning first and second substantially square adjustment plates respectively on said first and second parallel surfaces, said adjustment plates having corresponding holes therethrough with the hole through said first plate being threaded, the position of said holes being offcenter and at differing distances from each edge of the substantially square plates, one edge of each of said plates being secured against the projecting lip across the exterior end of its respective flat parallel surface;

inserting a threaded tappet bolt through said first arm slot, and said first and second adjustment plates, said threaded bolt engaging the threaded hole in said first plate, the first end of said bolt having socket means for engaging the end of the cam actuated push rod;

securing said tappet bolt at a desired position in said first arm slot by applying and tightening a threaded nut to the end of said bolt extending from said second adjustment plate; and

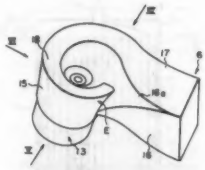
adjusting the position of said tappet bolt along the length of said slot by loosening said threaded nut and rotating said first and second adjustment plates on said parallel surfaces as desired to thereby vary the effective push rod arm length and the stroke of the valve.

4,519,346

HELICALLY-SHAPED INTAKE PORT OF AN INTERNAL COMBUSTION ENGINE

Kiyoshi Nakanishi, and Takeshi Okumura, both of Susono, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 38,819, May 14, 1979, abandoned. This application Aug. 4, 1981, Ser. No. 290,100
Claims priority, application Japan, Sep. 25, 1978, 53-116666
Int. Cl.³ F02M *35/10*
U.S. Cl. 123—188 M **10 Claims**



1. An intake port of a spark-ignition internal combustion engine, which intake port includes a helical portion having an upper wall, a helically curved peripheral side wall, and an outlet at the bottom of the helix, wherein an intake valve is arranged at said outlet, and said peripheral side wall extends circumferentially about an axis of said intake valve, and an inlet passage portion tangentially connected at one end to said helical portion and having an inlet at its other end, said inlet passage portion being defined by an upper wall, a bottom wall, a first side wall, and a second side wall, said second side wall being more remote from the axis of said intake valve than said first side wall and being connected to the peripheral side wall of said helical portion, wherein said first side wall of said inlet passage portion has an inclined wall portion at said other end, the direction in which said wall portion is inclined being such as to make the width of said inlet passage portion above the lower edge of the inclined wall portion at any point along said inlet passage portion narrower than the width of said inlet passage portion below said inclined wall portion at said point, the width of said inclined wall portion increasing gradually towards said helical portion to comprise the entire first side wall at said one end of said inlet passage portion which is tangentially connected to said helical portion such that the cross-sectional shape of the passage at the entrance to the helical portion is trapezoidal, and the intake port comprising a valve guide projecting into said helical portion from the upper wall of said helical portion and having a circumferential wall, an upper part of said first side wall being tangentially connected to the circumferential wall of said valve guide, and a lower part of said first side wall being connected to the peripheral side wall of said helical portion so as to deflect part of the flow through the intake port downwards toward the outlet of the helical portion while allowing the remainder of the flow to pass around the helically curved peripheral side wall, thereby introducing said part of the flow directly into the combustion chamber with minimum flow resistance while allowing said remainder of the flow to develop a strong swirl motion in the helical portion of the intake port.

4,519,347

BRACKET FOR SUPPORTING LOW PRESSURE GAS CARBURETOR AND COMPONENTS

Robert L. Nolff, Romulus, Mich., assignor to Propane Carburetion Company, Inc., Romulus, Mich.

Continuation of Ser. No. 351,019, Feb. 22, 1982, abandoned. This application Aug. 9, 1983, Ser. No. 521,716
Int. Cl.³ F02F *7/00*
U.S. Cl. 123—195 A **4 Claims**

1. In combination with a low pressure gas, internal combus-

tion engine intake manifold having an opening for receiving a fuel and air mixture;

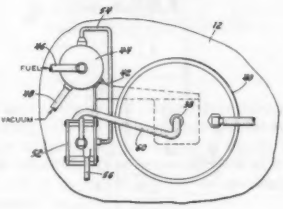
throat means having an opening, and fastener means for mounting the throat means on the intake manifold such that the throat opening is aligned with the intake manifold opening to pass a fuel and air mixture thereto;

a carburetor mounted on the throat means for delivering a fuel and air mixture through the throat means to the intake manifold;

an air cleaner having a generally cylindrical wall mounted on the carburetor such that the carburetor is substantially disposed within the air cleaner;

body means;

first mounting plate means carried by the body means, and second mounting plate means carried by the body means;



a low pressure gas converter mounted on the first mounting plate means, and conduit means for delivering low pressure gas from the converter to the carburetor;

fuel filter means mounted on the second mounting plate means in spaced relationship with respect to the gas converter, and conduit means connecting the fuel filter means to the gas converter;

the body means being supported adjacent the carburetor such that the gas converter and the fuel filter means are disposed adjacent the cylindrical wall of the air cleaner in spaced relationship to the throat means and the carburetor; and

means forming a connection between the body means and the carburetor such that the body means, the throat means, the carburetor, the fuel filter and the converter are removable as a unit from the engine intake manifold.

4,519,348

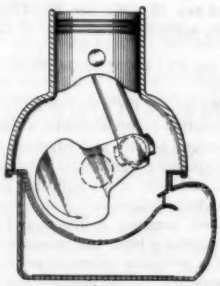
OIL PAN AND WINDAGE TRAY FOR HIGH PERFORMANCE ENGINES

Edward Hamilton, 1746 Todd Rd., Toms River, N.J. 08753

Filed Apr. 21, 1983, Ser. No. 487,071

Int. Cl.³ F16N *31/00*

U.S. Cl. 123—195 C **12 Claims**



1. An improved tray and skimmer for an internal combustion engine that has rotating components, a crankcase housing at least some of the components, a lubrication system for supplying oil to the components, and an oil pan, the tray and skimmer comprising:

(a) a pair of longitudinally extending mounting flanges of a length substantially equal to longitudinally extending surfaces of the crankcase of the engine against which the pan mounts, the mounting flanges having means for mounting the tray and skimmer to the crankcase along the longitudinal surfaces of the crankcase and sandwiched between the crankcase and the pan;

(b) the skimmer extending longitudinally proximate one of the mounting flanges and on the side of the tray that will face opposite the direction of rotation of the engine's rotating components, the skimmer being adapted to scrape oil from the rotating components and for the adjustment of the clearance between it and the rotating components;

(c) the tray and one of the mounting flanges being physically connected together via a wall means with the tray and skimmer underlying the mounting flanges with the skimmer being in position for directing oil flung from rotating components of the engine towards the skimmer and for preventing oil in the pan from splashing up onto the rotating components;

(d) passage means through said wall means located between the tray and the skimmer to pass oil from the rotating components into the pan; and

(e) the tray and skimmer being physically separate from the pan so that the clearance between the skimmer and the rotating components can be adjusted without the pan being mounted to the crankcase and blocking visual observation of the clearance.

4,519,349

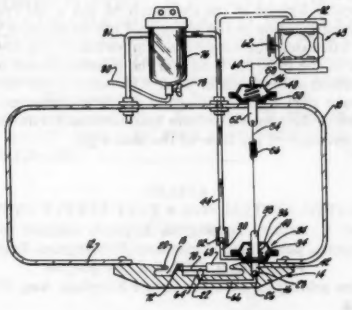
WATER EJECTOR FUEL SYSTEM

Jack E. Cheney, Haslett, Mich., assignor to Schmelzer Corporation, Flint, Mich.

Filed Nov. 8, 1982, Ser. No. 439,744

Int. Cl.³ F02B *77/06*

U.S. Cl. 123—198 R **20 Claims**



1. Apparatus for ejecting water from a fuel system of an internal combustion engine comprising: a fuel reservoir, pump means having an inlet communicating with said reservoir and an outlet communicating with the exterior of said reservoir, said pump means including reciprocating means movable in one direction to suck fluid to said inlet and movable in the other direction to discharge fluid at said outlet, and actuating means for moving said reciprocating means in said one direction upon starting said engine and in said other direction upon stopping said engine.

4,519,350

INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

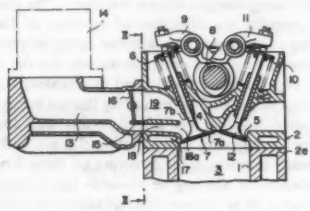
Hiroyuki Oda; Yasuyuki Morita, and Akihito Nagao, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Tokyo, Japan

Filed Apr. 25, 1983, Ser. No. 488,618

Claims priority, application Japan, Apr. 26, 1982, 57-69931

Int. Cl.³ F02B *31/00*

U.S. Cl. 123—308 9 Claims



1. An improved intake system for an internal combustion engine comprising a primary intake passageway which has an opened end directed toward an intake port of a combustion chamber formed in a cylinder head having and exhaust port and an ignition plug and which connects the intake port with an intake gas source, a secondary intake passageway having an open end directed toward the intake port to connect it to an intake gas source, and intake valve provided in the intake port to close and open it, and a controllable valve means which is adapted to be opened so that the intake gas is introduced into the combustion chamber through both the primary and secondary intake passageways when the load on the engine is not lighter than a predetermined value and to be closed otherwise so that the intake gas is introduced into the combustion chamber only through the primary intake passageway, the center of the primary intake passageway being offset from the center of the cylinder bore, the improvement comprising that the primary intake passageway formed in the cylinder head extends substantially in parallel with the lower end surface of the cylinder head in the vicinity of the intake port so as to introduce the intake gas into the combustion chamber in the direction parallel with said lower end surface the primary intake passageway formed in the cylinderhead has a flat cross sectional configuration in the vicinity of the intake port with its longer axis extending substantially in parallel to the lower end surface of the cylinder head and the primary intake passageway formed in the cylinder head is throated in the vicinity of the intake port by narrowing its width as measured in the direction of the longer axis from upstream toward downstream in the direction of the flow of the intake gas.

4,519,351

CONTROL SYSTEM FOR A FUEL SUPPLY SYSTEM

Michael A. Archer, Teddington, England, assignor to Lucas Industries, public limited company, Birmingham, England

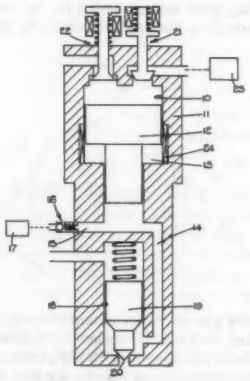
Filed Aug. 9, 1984, Ser. No. 639,148

Claims priority, application United Kingdom, Aug. 25, 1983, 8322888

Int. Cl.³ F02D *31/00*

U.S. Cl. 123—357 3 Claims

1. A control system for a fuel supply pump for an internal combustion engine, the pump being of the kind comprising a pumping piston reciprocable within a bore, an outlet for fuel at high pressure from one end of the bore, said outlet in use being connected to an injection nozzle of an associated engine, a first solenoid operable valve through which liquid under pressure can be admitted to the other end of the bore to cause displacement of said pumping piston towards said one end of the bore and delivery of fuel through said outlet, a second solenoid operated valve through which liquid can escape from said other end of the bore as a result of movement of said piston towards the other end of the bore under the action of fuel under pressure admitted through a non-return valve to said one end of the bore and transducer means for providing an output signal representative of the position of said piston within the bore and the amount of displaceable fuel in the bore comprising a governor circuit for controlling the operation of said first and second solenoid operated valves said governor circuit receiving an operator demand signal and engine position signals whereby the valves are operated in timed relation to the engine said governor circuit producing a desired fuel signal,



comparator means for comparing the desired fuel signal and the output of said transducer means during the period of closure of both valves, said comparator means producing a switch enable signal in the event that the displaceable fuel in said bore is greater than the desired fuel, means including a switch for producing a speed signal the polarity of which depends upon the state of said switch, an integrator which receives said speed signal, a summing amplifier including a summing junction, the output of said integrator being supplied to said summing junction together with said desired fuel signal, the output of said summing amplifier being supplied through circuit means to said governor circuit.

4,519,352

CONTROLLING DEVICE FOR A FUEL-QUANTITY ADJUSTING MEMBER OF A FUEL INJECTION PUMP

Franz Eheim, Stuttgart; Gerald Höfer, Weissach-Flacht; Karl Konrath, Ludwigsburg, and Max Straubel, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,810

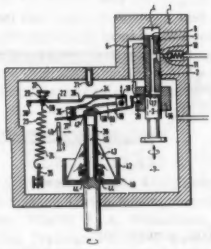
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147701

Int. Cl.³ F02M *59/24, 59/42*

U.S. Cl. 123—373 4 Claims

1. A controlling device for a fuel-quantity adjustment element of a fuel injection pump including a dual-arm adjusting lever pivotable around a shaft, said adjusting lever being coupled with a fuel-quantity adjustment element, a drag lever pivotable around said shaft of the adjusting lever, a governor spring assembly which stresses said drag lever with a variable load/rpm-dependent pressure, a first stop for stopping said drag lever, said adjusting lever communicates with said drag lever by way of a pivotable intermediate lever, a first stop which defines movement of said intermediate lever relative to said drag lever, a second stop which limits the distance between said intermediate lever and said adjusting lever, whereby a first compression spring is disposed between said intermediate lever and said drag lever, and a second compres-

sion spring is disposed between said intermediate lever and said adjusting lever, further including a device for generating rpm-dependent pressure transmittable to the drag lever via an adjusting sleeve and counter to a force of the governor spring assembly, whereby the drag lever and the adjusting lever are



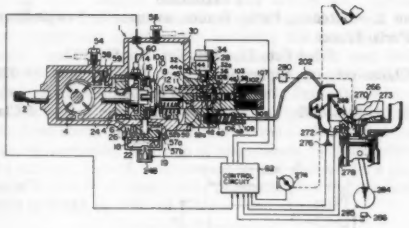
coupled at least at the end of each relative movement effected by the actuating element; the drag lever and the adjusting lever being jointly adjustable by the adjusting sleeve, characterized in that said adjusting lever communicates with at least one adjustable stop in dependence from the operating parameters of a combustion engine.

4,519,353

DIESEL FUEL INJECTION PUMP FUEL INJECTION CUTOFF UPON DETECTION OF EXCESSIVE ACTUAL FUEL COMBUSTION TIME

Yoshiyasu Ito; Fumiaki Kobayashi, and Hideo Miyagi, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaishi, Toyota, Japan

Filed Sep. 13, 1984, Ser. No. 650,169
Claims priority, application Japan, Dec. 22, 1983, 58-242968
Int. Cl.³ F02D *31/00*
U.S. Cl. 123—359 **5 Claims**



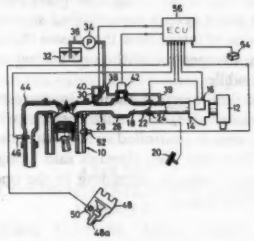
1. For a diesel engine:
a fuel injection pump, comprising:
(a) a means for calculating a proper fuel injection amount per each engine stroke;
(b) a means for injecting an amount of fuel per each engine stroke approximately equal to said proper fuel injection amount determined by said injection amount calculating means;
(c) a means for calculating a reference combustion time which represents approximately how long combustion in an engine stroke should last;
(d) a means for detecting the approximate start and end of combustion in said engine stroke;
(e) a means for calculating the approximate actual time of combustion in said engine stroke from information furnished by said means for detecting combustion start and end;
(f) a means for cutting off fuel injection; and
(g) a means for actuating said means for cutting off fuel injection according to comparison of said calculated approximate actual combustion time and said calculated reference combustion time.

4,519,354

FUEL SUPPLY SYSTEM IN INTERNAL COMBUSTION ENGINE

Yuuichi Katoh; Hiroki Matsuoka, and Minoru Iwata, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Apr. 29, 1983, Ser. No. 490,114
Claims priority, application Japan, Apr. 30, 1982, 57-72496
Int. Cl.³ F02B *33/00*
U.S. Cl. 123—472 **2 Claims**



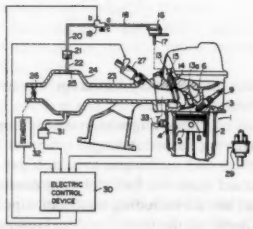
1. A fuel supply system of an internal combustion engine, comprising:
an injector for injecting fuel;
a fuel flow path for supplying fuel to said injector; and
an assist air flow path for supplying assist air to expedite spraying of the fuel to the neighborhood of a jet of said injector, wherein at least part of said assist air flow path is disposed in direct contact with a part of said fuel flow path on an engine compartment side thereof, said part covering an outer periphery of a fuel delivery pipe in a substantially U-shape, whereby said part of the fuel flow path is thermally insulated from the engine compartment and cooled by assist air flowing through said assist air flow path.

4,519,355

METHOD OF CONTROL OF INTERNAL COMBUSTION ENGINE VARIABLE SWIRL AIR-FUEL INTAKE SYSTEM WITH DIRECT AND HELICAL INTAKE PASSAGES

Kazushiro Fujimura, and Toshimitsu Ito, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Sep. 10, 1984, Ser. No. 648,976
Claims priority, application Japan, Apr. 24, 1984, 59-82500
Int. Cl.³ F01L *3/06;* **F02B** *31/00;* **F02N** *17/00*
U.S. Cl. 123—491 **2 Claims**



1. For an air-fuel intake system, incorporated in an internal combustion engine having a cylinder head which defines a combustion chamber, comprising an intake port a downstream end of which opens to said combustion chamber and which

includes a helical passage which extends helically around and towards its said downstream end and a straight passage which extends substantially straight towards its said downstream end, a fuel injection nozzle which injects fuel into said intake port, and an intake passage switchover control valve system which is controllable so as to selectively alter the proportions of intake flow that pass through said straight passage and said helical passage:

a method of control, wherein from immediately after starting of the engine for a certain time period the amount of fuel injected through said fuel injection nozzle is increased by a ratio dependent on the temperature of the engine, and wherein:

when said fuel injection amount increase ratio is greater than or equal to a certain value, said intake passage switchover control valve system is controlled so as to maximize the proportion of intake flow that passes through said straight passage, irrespective of the operational conditions of the engine; while

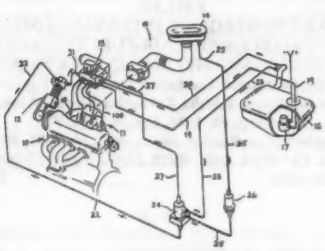
when said fuel injection amount increase ratio is less than said certain value, said intake passage switchover control valve system is controlled so as to alter the proportions of intake flow that pass through said straight passage and said helical passage, according to the operational conditions of the engine.

4,519,356

INTERNAL COMBUSTION ENGINE FUEL AND AIR SYSTEM

Tony R. Sarich, Karrinyup, Australia, assignor to Orbital Engine Company Proprietary Limited, Balcatta, Australia

Filed Dec. 30, 1982, Ser. No. 454,658
Claims priority, application Australia, Dec. 31, 1981, PF2126
Int. Cl.³ F02M *69/08*
U.S. Cl. 123—533 **19 Claims**



1. Apparatus for supplying liquid fuel by gas pressure to an engine comprising

a gas circuit including a means to supply compressed gas to a fuel metering device and a gas reservoir from which gas is drawn by said means and to which gas or gas and fuel are returned from the fuel metering device,

a liquid fuel circuit including means to supply liquid fuel to the fuel metering device a liquid fuel reservoir from which liquid fuel is drawn by said means and to which fuel or gas and fuel are returned from the liquid fuel metering device,

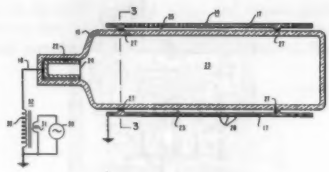
said gas reservoir and fuel reservoir being in communication so that the compressed gas supply means may draw gas including entrained fuel vapour from both reservoirs.

4,519,357

AIR IONIZER FOR INTERNAL COMBUSTION ENGINES

Don M. McAllister, Wethersfield, Conn., assignor to Am-Air Limited Partnership, Md.

Filed Sep. 29, 1982, Ser. No. 428,471
Int. Cl.³ F02M *27/00*
U.S. Cl. 123—539 **18 Claims**



1. An air ionizer, comprising:

a glass tube having a major portion with a generally cylindrical electrically nonconductive wall with inner and outer wall surfaces, and an extension substantially coaxial with said major portion;

an inner electrode disposed entirely within the extension of said tube;

an ionizable gas comprising an inert gas or mercury vapor disposed within said tube in communication with said inner electrode and the inner wall of the major portion of the tube;

a foraminous outer copper electrode spaced from and substantially surrounding the outer surface of only the major portion of said tube; and

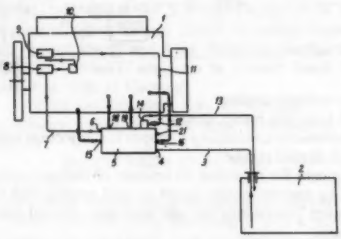
means for applying a high voltage between said inner and outer electrodes to ionize said gas and to generate ozone in air or oxygen-containing gas introduced into the space adjacent said outer surface of said tube.

4,519,358

FUEL HEATING METHOD AND DEVICE FOR VEHICLES

Jean E. A. Redele, Paris, France, assignor to Sxoma-Energie, Paris, France

Filed Feb. 22, 1984, Ser. No. 582,502
Claims priority, application France, Feb. 22, 1983, 83 02821
Int. Cl.³ F02M *31/00*
U.S. Cl. 123—557 **6 Claims**



1. In an internal combustion diesel engine including means for circulating an engine cooling liquid through said engine, and means for circulating an engine lubricating oil through said engine for lubricating the moving parts thereof, a fuel tank for said engine, and a device for heating diesel fuel circulating from said fuel tank to said engine, the improvement wherein said device comprises a heat exchanger, three separate heat exchange circuits within said heat exchanger, including a first circuit for circulating engine cooling liquid from said engine, a second circuit for circulating fuel from said fuel tank to said

engine, and a third circuit for circulating motor lubricating oil, and wherein said heat exchanger includes means defining separate heat exchange surfaces between said oil circuit and said fuel circuit, between said cooling liquid circuit and said fuel circuit and between said oil circuit and said cooling liquid circuit, for effecting simultaneously direct heat exchange between the fuel to be heated and the motor lubricating oil, and between the fuel to be heated and the engine cooling liquid, such that said diesel fuel passing through said heat exchanger absorbs heat from the relatively cool engine cooling liquid and is further heated by the hotter motor lubricating oil to a significantly higher degree than that available solely from the engine cooling liquid without danger of overheating the diesel fuel.

4,519,359

MULLITE PLATE

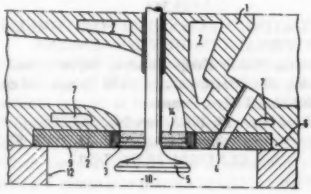
Ulf Dworak, Baltmannsweiler; Hans Olapinski, Aichwald; Dieter Fingerle, Hochdorf; Ulrich Krohn, Leonberg, all of Fed. Rep. of Germany; Martti J. A. Hakulinen, Rönninge, and Bengt N. J. Palm, Nykvarn, both of Sweden, assignors to Feldmühle Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Mar. 1, 1984, Ser. No. 585,172

Claims priority, application Fed. Rep. of Germany, Mar. 1, 1983, 3307115

Int. Cl.³ F02F *1/24*

U.S. Cl. 123—668 **5 Claims**



1. In a cylinder head of a piston engine having a thermal insulation component in the form of a planar plate made by sintering from ceramic materials and which has openings therethrough, the improvement comprising said thermal insulation component substantially covering the surface of the cylinder head facing the combustion chamber and being shrink-fitted or gripped in the cylinder head, said insulation component consisting of: 2 to 30 vol.% of a first oxide selected from the group consisting of zirconium oxide and hafnium oxide; from about 1 to 3 mol.% of a second oxide selected from the group consisting of oxides of magnesium, calcium, yttrium and a mixture thereof, with respect to said first oxide; a maximum of 0.5 wt.% of other oxidic impurities; and the remainder mullite to make up 100 vol.%.

4,519,360

ACCELERATOR PEDAL CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

Terukiyo Murakami, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 9, 1984, Ser. No. 598,204

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—399 **3 Claims**

1. An accelerator pedal control system for an automotive vehicle, which comprises:

(a) an accelerator pedal;

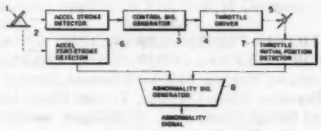
(b) a throttle valve;

(c) means for detecting a stroke of said accelerator pedal and outputting an accelerator pedal stroke signal;

(d) means for calculating a target throttle valve opening rate in response to the detected accelerator pedal stroke signal and generating a target throttle valve opening rate control command signal corresponding thereto;

(e) means for driving said throttle valve in response to the target throttle valve opening rate control command signal;

(f) means for detecting that said accelerator pedal is at its zero-stroke position and outputting an accelerator pedal zero-stroke signal;



(g) means for detecting that said throttle valve is at its initial position and outputting a throttle valve initial-position signal; and

(h) means for genertng an abnormality command signal when the throttle-valve initial-position signal is not outputted within a predetermined time interval after the accelerator pedal zero-stroke signal has been outputted.

4,519,361

THROTTLE CONTROL SYSTEM FOR AUTOMOTIVE VEHICLE

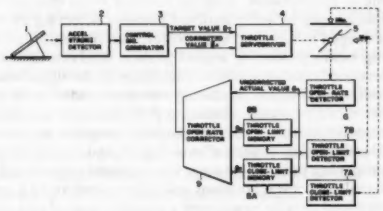
Terukiyo Murakami, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 9, 1984, Ser. No. 598,205

Claims priority, application Japan, Apr. 11, 1983, 58-63285

Int. Cl.³ F02D *9/00*

U.S. Cl. 123—399 **5 Claims**



1. A throttle control system for an automotive vehicle, which comprises:

(a) an accelerator pedal;

(b) a throttle valve;

(c) means for detecting a stroke of said accelerator pedal and outputting an accelerator pedal stroke signal;

(d) means for calculating a target throttle valve opening rate in response to the detected accelerator pedal stroke signal and generating a target throttle valve opening rate control command signal corresponding thereto;

(e) means for detecting an actual throttle valve opening rate and outputting an actual throttle valve opening rate signal corresponding thereto;

(f) means for detecting that said throttle valve is driven to its fully-closed position and outputting a throttle valve close-position signal corresponding thereto;

(g) means for detecting that said throttle valve is driven to its fully-open position and outputting a throttle valve open-position signal corresponding thereto;

(h) means for storing the actual throttle valve fully-closed position opening rate in response to the throttle valve close-position signal;

(i) means for storing the actual throttle valve fully-open position opening rate in response to the throttle valve open-position signal;

(j) means for correcting the actual throttle valve opening

rate on the basis of the stored actual throttle valve fully-closed and fully-opened position opening rates and outputting a corrected throttle valve opening rate; and

(k) means for driving said throttle valve in response to the target throttle valve opening rate control command signal and the corrected actual throttle valve opening rate signal.

4,519,362

ROTATIONAL POSITION DETECTING APPARATUS FOR INTERNAL COMBUSTION ENGINES

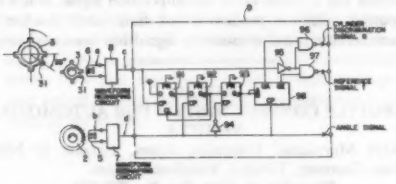
Miyao Arakawa, Nagoya; Akihiko Takenaka, Kariya; Masahiro Sato, Toyoake; Hideo Ohyama, Toyota; Hiroo Utsumi, Kariya, and Shingo Inoue, Anjo, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 5, 1984, Ser. No. 617,475

Claims priority, application Japan, Jun. 6, 1983, 58-100606

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—414 **4 Claims**



1. A rotational position detecting apparatus for internal combustion engines comprising:

first and second signal producing means each thereof including a signal rotor fixedly mounted on a rotary shaft rotating in synchronism with the rotation of an internal combustion engine and rotational position detecting elements arranged to face said signal rotor, said first signal producing means producing angle signals at intervals of a predetermined rotational angle of said engine, the signal rotor of said second signal producing means provided with a plurality of first signal producing positions each thereof corresponding to a reference angular position of one of a plurality of cylinders of said engine and a second signal producing position between two adjacent ones of said first signal producing positions and corresponding to a predetermined angular position of a specified one of said engine cylinders;

a first and a second waveform reshaping circuit for reshaping the waveform of output signals from said first and second signal producing means, respectively; and

a signal processing circuit for receiving output signals from said first and second waveform reshaping circuits and utilizing the reshaped angle signals supplied from said first waveform reshaping circuit as clock signals to separate reference signals indicative of said reference angular positions of said engine cylinders and a cylinder discrimination signal indicative of said predetermined angular position of said specified engine cylinder from among the output signals of said second waveform reshaping circuit and to output said reference signals and said cylinder discrimination signal.

4,519,363

INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE PROVIDED WITH SEVERAL INTAKE VALVES

Luigi Bernardoni, Tradate-Varese, and Domenico D'Angelo, Monza-Milan, both of Italy, assignors to Alfa Romeo Auto S.p.A., Napoli, Italy

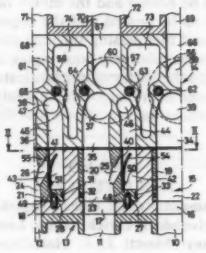
Filed Jan. 17, 1984, Ser. No. 571,663

Claims priority, application Italy, Feb. 2, 1983, 19397 A/83

Int. Cl.³ F02M *25/06;* **F02B** *27/00*

U.S. Cl. 123—432 **4 Claims**

1. An intake system for a multi-cylinder internal combustion engine of the type comprising plural intake ducts and plural engine actuated intake valves for each cylinder, each engine actuated intake valve being arranged in a respective one of said plural intake ducts, and further comprising a non-return valve for each cylinder arranged inside one of said plural intake ducts



of each cylinder in series with the respective one of said engine actuated intake valves, said non-return valve being arranged to allow fluid flow towards the respective cylinder and to prevent fluid flow from said one of said plural intake ducts to the outside.

4,519,364

VALVE-ACTUATING MECHANISM FOR THREE-VALVE INTERNAL-COMBUSTION ENGINE

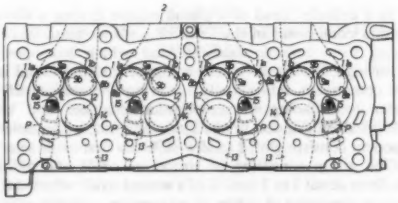
Masaru Enomoto, Wako; Kenji Kimura, Sayama, and Keiichi Kawada, Soka, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 18, 1983, Ser. No. 553,286

Claims priority, application Japan, Nov. 24, 1982, 57-205829

Int. Cl.³ F02M *23/04, 7/00*

U.S. Cl. 123—432 **2 Claims**



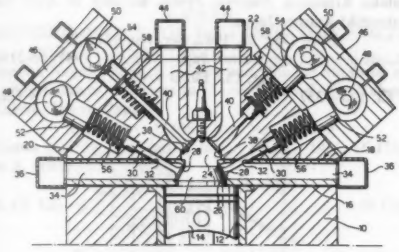
1. In a three-valve internal-combustion engine having a combustion chamber formed in the inner surface of a cylinder head so as to face the upper surface of a piston, two intake valves arranged side by side on one side of a roof surface of said combustion chamber, and an exhaust valve and an ignition source disposed on the other side thereof, a valve-actuating mechanism comprising: a cam shaft axially disposed along a straight line substantially equidistant from said intake valves and said exhaust valve; two intake valve-actuating cams and one exhaust valve-actuating cam mounted on said cam shaft, said exhaust valve-actuating cam being disposed between said two intake valve-actuating cams, with said two intake valve-actuating cams being symmetrically parallel to each other; rocker arm shafts supported on said cylinder head so as to extend parallel to said cam shaft; and intake rocker arms and an exhaust rocker arm pivotably mounted on said rocker arm shafts, said valve-actuating cams and the stem ends of said two intake valves and said exhaust valve engaging said intake rocker arms and said exhaust rocker arm, respectively, one of said two intake rocker arms and said exhaust rocker arm being formed to have the same dimensions for interchangeability therebetween.

4,519,365

RECIPROCATING INTERNAL COMBUSTION ENGINE WITH MULTIPLE-VALVE CYLINDERS

Mario Anfusio, Via S. Matteo 23, Moncalieri (Torino), Italy

Filed Feb. 17, 1984, Ser. No. 581,017
Claims priority, application Italy, Feb. 24, 1983, 67207 A/83
Int. Cl.³ F02B *15/00*
U.S. Cl. 123—432 2 Claims



1. A reciprocating internal combustion engine of the type including an engine block defining at least one cylinder, a piston slidable in said at least one cylinder, a head structure which defines a combustion chamber in correspondence with said at least one cylinder, a pair of transversely opposed mushroom valves associated with the combustion chamber and disposed in a V relative to the axis of said at least one cylinder, said valves having stems slidably mounted in the head structure, respective seats for said valves formed in said head structure facing the combustion chamber, and inlet and exhaust ducts defined by the head structure terminating at said valve seats respectively, wherein the improvement comprises:

said head structure including a cylinder head and a separate inserted plate clamped between the cylinder head and said engine block;

said combustion chamber of said at least one cylinder being formed in said cylinder head in a position centered on the axis of the cylinder;

said inserted plate being formed with an aperture centered on the axis of said at least one cylinder which puts the cylinder into communication with the combustion chamber;

said inserted plate defining, in correspondence with said at least one cylinder, at least one first pair of opposing valve seats facing said communication aperture, said seats having respective associated mushroom valves with stems slidable in said cylinder head, first respective inlet/exhaust ducts terminating at the valve seats of said at least one first pair, and respective holes in which said valve stems are slidable;

said cylinder head defining, in correspondence with said at least one cylinder, at least one second pair of opposing valve seats facing into said combustion chamber, said seats having respective associated mushroom valves with stems slidable in said cylinder head, the axes of these valves being substantially coplanar with the axes of said valves of said at least one first pair of seats, and respective second inlet/exhaust ducts terminating at the valve seats of said at least one second pair, and

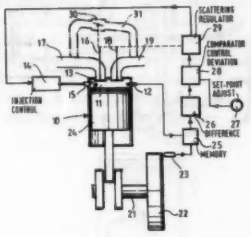
said piston having on its crown a projection of a form adapted to substantially fill said communication aperture when the piston is at top dead-centre.

4,519,366

METHOD AND APPARATUS FOR CONTROLLING THE COMPOSITION OF THE COMBUSTION CHARGE IN INTERNAL COMBUSTION ENGINES

Michael G. May, Bel Air, CH-1180 Rolle, Switzerland

Filed Mar. 24, 1983, Ser. No. 478,567
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1982, 3210810
Int. Cl.³ F02D *35/02*
U.S. Cl. 123—435 31 Claims



1. An apparatus for controlling the composition of a combustion charge in an internal combustion engine having externally supplied ignition, said charges comprising an oxygen infused gas and a fuel, and said engine including a crankshaft, at least one cylinder having a piston operatively connected to said crankshaft for reciprocal motion therein, a combustion chamber in which during each combustion cycle a combustion charge is progressively ignited beginning at an ignitor location within said chamber to cause said piston to move toward an extreme position, and the progressive ignition of said charge defining a flame-front which expands throughout said chamber from said ignition location, comprising:

detection means in proximity with said combustion chamber and said crankshaft for directly ascertaining events ϕ corresponding to combustion and crankshaft angle,

means for storing a plurality of values of said events,

means for determining the scattering value of said stored events ϕ for consecutive combustion charges,

means providing a set-point value of a target scatter value of said events,

comparison means for comparing said scatter value of said stored values with said set-point value, and

regulating means responsive to said comparison means for adjusting the composition of said charge.

7. A method for controlling the composition of combustion charges in an internal combustion engine having externally-supplied ignition, said charges comprising an oxygen infused gas and a fuel, and said engine including a crankshaft, at least one cylinder having a piston operatively connected to said crankshaft for motion therein, a combustion chamber in which during each combustion cycle a combustion charge is progressively ignited beginning at an ignition location within said chamber to cause said piston to move towards an extreme position, and the progressive ignition of said charge defining a flame-front which expands throughout said chamber from said ignition location, comprising the steps of:

directly detecting in said chamber during at least one operating range of said engine an event in terms of a value ϕ caused by combustion of said charges related to said piston position at which a predetermined status of said events is attained,

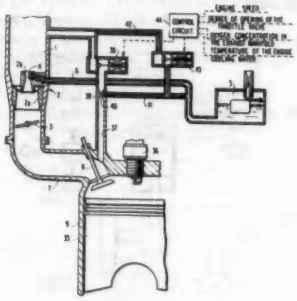
determining the scattering value of said events for consecutive combustion charges, and

regulating said scattering value towards a set-point value of said scattering by adjusting the composition of said charge.

4,519,367
CARBURETOR

Isshi Nomura, Aichi, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Jan. 28, 1983, Ser. No. 461,708
Claims priority, application Japan, Jan. 28, 1982, 57-12292
Int. Cl.³ F02M 7/16
U.S. Cl. 123—440 4 Claims



1. A carburetor for an internal combustion engine having an intake manifold and a suction valve means comprising a first air passage having an upper portion in communication with the atmosphere and a lower portion adapted to be connected to the intake manifold of an internal combustion engine, first venturi means and throttle valve means located in said first air passage, a fuel supply chamber, a first fuel passage having one end in communication with said first venturi means and the other end in communication with said fuel chamber, a second air passage having one end in communication with said intake manifold downstream of said throttle valve means and immediately upstream of said suction valve means and the other end in communication with said first air passage upstream of said first venturi means, second venturi means located in said second air passage, a first solenoid operated valve device positioned within said second air passage for controlling the flow of air therethrough, a second fuel passage having one end in communication with said second venturi means and the other end in communication with said fuel chamber, a third air passage having one end in communication with said second fuel passage and the other end in communication with said first air passage upstream of said first venturi means and a second solenoid operated valve device positioned in said third air passage to control the flow of air therethrough.

4,519,368
FUEL INJECTION RAIL ASSEMBLY

Sharon J. Hudson, Jr., Lambertville, Mich., assignor to Sharon Manufacturing Company, Lambertville, Mich.

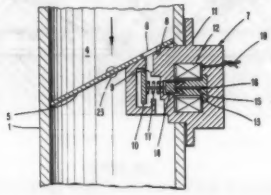
Continuation-in-part of Ser. No. 374,485, May 4, 1982, Pat. No. 4,457,280. This application Jun. 22, 1984, Ser. No. 623,403
Int. Cl.³ F02M 55/02
U.S. Cl. 123—468 8 Claims

1. A fuel rail assembly for holding a plurality of separate electromechanical fuel injectors in position on an internal combustion engine, said assembly comprising: an elongated hollow fuel rail beam, a plurality of injector cups mounted in a row along said beam in circular apertures, said cups being in direct fluid communication with the hollow interior of said beam, and a divider in said beam partitioning said interior into passageways one of which has a closed end and an open end, said open end being in fluid communication with another passageway which provides a fluid flow path in a counter current direction to the flow path of said first mentioned passageway.

4,519,369
AIR SUCTION DEVICE FOR DIESEL ENGINE

Kazuhiko Kitamura, Nagoya, Japan, assignor to Aisin Keiki Kabushiki Kaisha, Japan

Filed Dec. 23, 1982, Ser. No. 452,828
Claims priority, application Japan, Dec. 26, 1981, 56-214836
Int. Cl.³ F02D 9/08
U.S. Cl. 123—337 4 Claims



1. An air suction device for a diesel engine having a throttle valve disposed within an air suction passage, said air suction device comprising:

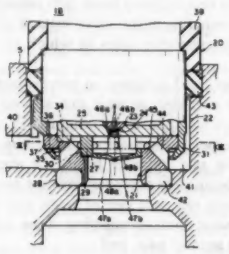
a. an opening in said throttle valve through which air may pass even when said throttle valve is in a closed position; and

b. air flow controlling means positioned within said air suction passage adjacent said throttle valve for selectively controlling the flow of air which may pass through said opening in said throttle valve, said air flow controlling means including: (i) an air flow passage which is located within said air suction passage and which is aligned to receive air from said opening of said throttle valve when said throttle valve is in a closed position, and (ii) valve means for selectively restricting the flow of air through said air flow passage in response to a control signal.

4,519,370
FUEL INJECTOR ELECTRONICALLY CONTROLLED ENGINE

Minoru Iwata, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed May 4, 1983, Ser. No. 491,642
Claims priority, application Japan, Feb. 23, 1983, 58-24452[U]
Int. Cl.³ F02B 15/00
U.S. Cl. 123—432 5 Claims



1. In an internal combustion engine wherein a combustion

chamber has a plurality of intake valves, intake air is divided into intake air path portions each leading to one of the intake valves and a fuel injector is provided upstream of the intake air path portions, said injector having means for admitting air thereto to collide with injected fuel in the fuel injector to atomize the injected fuel, characterized in that:

the fuel injector has a plurality of fuel injection ports directed into the respective intake air path portions and a plurality of air-fuel injection ports each aligned coaxially downstream of a respective fuel injection port and through which injected fuel passes after colliding with incoming air.

4,519,371

MOUNTING DEVICE FOR FUEL INJECTION NOZZLES FOR INTERNAL COMBUSTION ENGINES

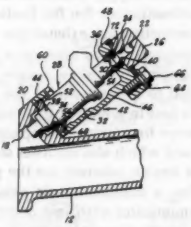
Hidenobu Nagase; Shigeru Suzuki, and Shinichi Shimada, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 3, 1982, Ser. No. 438,919

Claims priority, application Japan, Nov. 4, 1981, 56-163803[U]

Int. Cl.³ F02M *55/00*

U.S. Cl. 123—470 **10 Claims**



1. A device for mounting fuel injection nozzles and a fuel supply manifold for the nozzles to an engine, the nozzles each being of a type having upper and lower mounting surfaces perpendicular to the axis of the nozzle, comprising

a mounting structure of unitary construction having first and second coaxial, rigidly spaced holes for receipt of one fuel injection nozzle therein;

first attachment means for fixing said mounting structure to the engine;

second attachment means for fixing the fuel supply manifold to said mounting structure;

first and second seals positioned in said first and second holes respectively on the lower and upper mounting surfaces of the nozzle, said mounting structure being sized to compress said seals between the fuel supply manifold and the engine when assembled therewith, said first hole including a first shoulder in a plane perpendicular to the axis of said first hole facing away from said second hole, said first seal being resilient and extending from said first shoulder to beyond the end of said hole for compression of said first seal when said mounting structure is assembled with the engine and said first shoulder including a step in the surface of said first hole and a washer positioned at and retained by said step, said first seal abutting against said washer.

4,519,372

GAS INJECTION VALVE

James E. Hoffman, 6000 Linwood, Odessa, Tex. 79763

Filed Aug. 12, 1983, Ser. No. 522,862

Int. Cl.³ F02M *61/14*

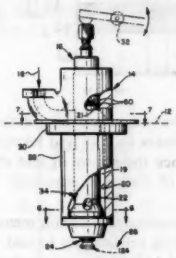
U.S. Cl. 123—470 **13 Claims**

1. In a gas engine having a cylinder head to which there is attached a valve cage, and a valve cartridge supported within the cage, wherein gaseous fuel can be connected to flow into the cage and through the cartridge, the combination with the cage of a valve cartridge for controlling fuel flow from the cage into a combustion chamber associated with the cylinder head;

said valve cartridge includes a main housing for support of said cartridge respective to a cage, a valve stem reciprocatingly received within said main housing, a valve seat affixed to the lower end of said main housing, seal means between said main housing and said stem;

said main housing has an axial passageway formed therethrough with said stem and seal means and seat being axially aligned therewith;

said main housing being separable into upper and lower members, with said seat being formed at the lower terminal end of the lower member, and with there being a valve element at one end of the valve stem which sealingly engages said seat when the valve stem is reciprocated to the open position; means attaching the confronting ends of said upper and lower members together, a seal chamber



formed in the marginal confronting ends of said upper and lower members, a unitized seal assembly removably received within said seal chamber;

said seal assembly has an internal seal means which sealingly engages a medial length of said valve stem, and an external seal means which sealingly engages a circumferentially extending wall formed on the interior of said seal chamber;

the axial passageway through said upper members form a valve stem guide; said axial passageway enlarges so it passes through the lower marginal end of said lower member and forms an annular gas passageway;

means forming a gas inlet port which extends through said main body and into said annular gas passageway;

said valve seat is in communication with said annular gas passageway; whereby,

said main housing can be separated into said upper and lower members to enable said seal assembly to be removed from the cartridge.

4,519,373

INTERNAL COMBUSTION ENGINE HAVING A VARIABLY ENGAGABLE SLIPPING WET CLUTCH FOR DRIVING A SUPERCHARGER

James A. Hardy, Playa del Rey, and David L. Alfano, Redondo Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.

Filed Sep. 30, 1982, Ser. No. 432,056

Int. Cl.³ F02B *39/12*

U.S. Cl. 123—559 **3 Claims**

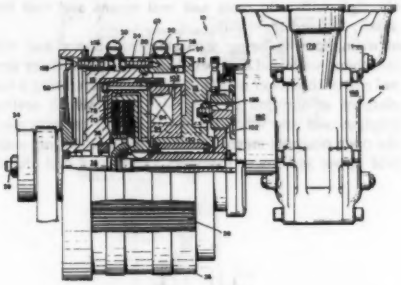
1. A supercharger of the type which converts engine torque into boost energy for delivery to the engine in the form of compressed air comprising:

compressor means communicated with a source of air to the engine and rotatably drivable for compressing the air and directing the same towards the engine;

a variably engagable slipping wet clutch means communi-

cated with the engine in torque receiving relationship thereto and with the compressor means to be capable of transmitting said torque to the compressor means and drive the same;

modulating means for variably controlling the amount of engine torque transmitted through said clutch means and to said compressor means to control the speed of the compressor;



lubricant distribution means for passing a lubricant about said clutch means to cool and lubricate the latter and to further enhance the ability of said clutch means to vary the amount of torque transmitted to said compressor means;

fan means for cooling said clutch means, said fan means in torque receiving relationship to said engine; and

means, mounted to said fan means for relaying an engine parameter to said modulating means.

4,519,374

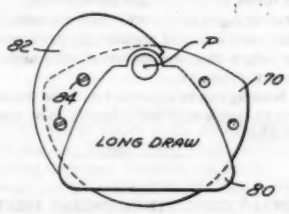
COMPOUND ARCHERY BOW

Larry D. Miller, 852 Dressler La., Rochester, Mich. 48063

Filed Jul. 6, 1982, Ser. No. 395,728

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—23 R **11 Claims**



1. In a compound shooting bow having a handle section and flexing limbs extending in opposite directions from said handle, each limb having a tip-mounted set of compound pulleys pivoted about a pivot axis, a draw string extending between said pulleys, and cables anchored respectively at each limb tip and passing to pulleys at the other limb tip, that improvement in which each set of compound pulleys comprises:

(a) a primary bow string pulley rotatable on said pivot axis, and

(b) a second base cable pulley juxtaposed with said primary pulley rotatable with and on the same axis as said primary pulley, and a plurality of add-on plates mountable on said primary pulley in the plane of said secondary pulley to alter the draw lengths of said bow string.

4,519,375

HOT-AIR HEATER

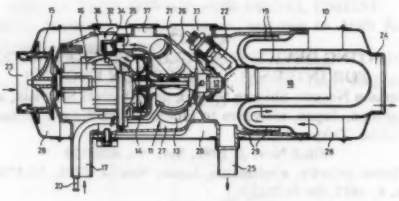
Rüdiger Galtz, Munich, Fed. Rep. of Germany, assignor to Webasto-Werke W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Feb. 14, 1984, Ser. No. 579,942

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1983, 3310501

Int. Cl.³ F24H *3/02*

U.S. Cl. 126—110 B **10 Claims**



1. A hot-air heater, especially for vehicles, having a burner secured in a housing, a fuel supply means for delivering fuel to said burner and a combustion-air fan for feeding combustion-air to said burner; combustion-air, exhaust-gas and heating-air ducts being constructed within said housing; a glow plug, said housing having an opening providing access to at least one space that is connected to at least one of the combustion-air and exhaust gas ducts and in which at least said glow plug is situated, a housing cover for closing said space relative to the outside of the heater and which also encloses said plug relative to the exterior of said heater; wherein, on the pressure side of the combustion-air fan, a combustion-air exhaust opening is provided which communicates with said combustion air duct and is blocked from communication with the outside of the heater only when the housing cover is fastened in place closing said space, and which is dimensioned in such a say that, when the combustion-air exhaust opening is not blocked, sufficient combustion air is exhausted therethrough exteriorly of the heater so that operation of the heater is not possible.

4,519,376

FIREPLACE ASSEMBLY

Terry G. Schoeff, Andrews, Ind., and Raymond A. Hemmert, deceased, late of Huntington, Ind. (by First National Bank, executor), assignors to American Standard Inc., New York, N.Y.

Division of Ser. No. 252,656, Apr. 9, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 528,194

Int. Cl.³ F24B *7/00*

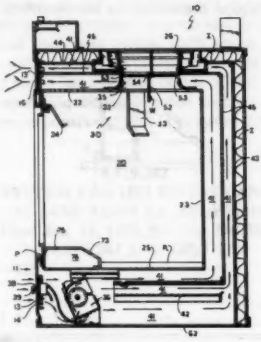
U.S. Cl. 126—121 **6 Claims**

1. A fireplace assembly having a combustion chamber including an open front end, a hearth, a rear wall, left and right side walls, a top wall substantially parallel to said hearth, a flue outlet opening in said top wall and a flue assembly; said flue assembly comprising:

a flue operatively mounted to said flue outlet opening and means mounted in said combustion chamber for diverting flow of combustion air and gases toward said flue outlet opening to reduce the pressure drop of the combustion air and gases exiting said combustion chamber; said flow diverting means including a pair of L-shaped, generally rectangular diverter plates mounted in said combustion chamber and being symmetrically arranged with respect to said flue outlet opening, one end and an adjacent side of each diverter plate being, respectively, positioned in abutting relation to at least a side wall and said top wall of said combustion chamber, said L-shaped end extending toward and terminating adjacent said flue outlet opening; and

said flue including an inwardly curved base defining a con-

verging nozzle whereby the velocity and turbulence of the combustion air and gases are reduced and are diverted



toward said flue outlet opening to prevent spillage of smoke and other combustion air and gases into the room.

4,519,377

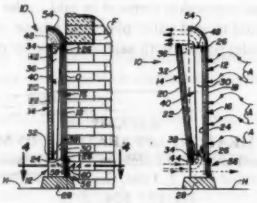
FIREPLACE HEAT TRANSFER APPARATUS

Thomas E. Taylor, 610 Highland Ave., Cheswick, Pa. 15204

Filed Jun. 1, 1984, Ser. No. 616,094

Int. Cl.³ F24B *7/00*

U.S. Cl. 126—121 **11 Claims**



1. Fireplace heat transfer apparatus, comprising:

(a) a main inner panel assembly supported across an opening of a fireplace so as to be heated by a fire in said fireplace to a temperature elevated above the temperature of ambient air outside of said fireplace, said main inner panel assembly including

(i) a main frame structure adapted to be mounted across said fireplace opening, and

(ii) at least one inner panel supported by said main frame structure across said fireplace opening, said inner panel being a first transparent plate of glass; and

(b) an auxiliary outer panel assembly supported by said inner panel assembly across said fireplace opening and spaced forwardly of said inner panel assembly so as to define a heat transfer chamber therebetween having top and bottom openings for communicating said chamber with said ambient air, said auxiliary panel assembly being movable relative to said main panel assembly between a first position in which said heat transfer chamber has a first volume supporting a first rate of convective thermosiphon flow of heated ambient air upwardly therethrough from said bottom opening to said top opening and a second position in which said heat transfer chamber has a second volume greater than said first volume and supporting a second rate of convective thermosiphon flow of heated ambient air greater than said first rate, said auxiliary outer panel assembly including

(i) an auxiliary frame structure pivotally mounted at its bottom end to a lower portion of said main frame structure, and

(ii) at least one outer panel supported by said auxiliary frame structure adjacent said inner panel being supported by said main frame structure, said outer panel being a second transparent plate of glass and being located more remote from said inner panel of said main inner panel assembly at said top opening when said auxiliary panel assembly is disposed in said second position than when disposed in said first position, whereby said heat transfer chamber has a generally uniform cross-section when said auxiliary panel assembly is disposed in said first position and a generally upwardly diverging cross-section when said auxiliary panel assembly is disposed in said second position.

4,519,378

HEATING DEVICE

Philip B. Mims, P.O. Box 36, Lorton, Va. 22079

Filed Aug. 13, 1981, Ser. No. 292,539

Int. Cl.³ F23G *3/00*

U.S. Cl. 126—225 **6 Claims**

1. A heating device for consuming newspapers by converting them to a carbon-like material and burning this material at a controlled rate comprising a housing having an open top and an open front defined by wall members, support means for suspending folded newspapers in the housing, a screen means engaging the front surface of the newspapers to control combustion thereof and to retain the newspapers in assembled relationship in order to assure complete combustion of the newspapers and to utilize the heat produced thereby, a forced draft device associated with the lower portion of the housing and newspapers supported thereon, a screen means extending below the newspapers supported in the housing and above the forced draft device, said forced draft device including a movable diffuser located below the screen means below the newspapers to supply air along a horizontally elongated area under the supported newspapers, said means supporting folded newspapers including a pair of generally horizontally disposed support rods supported in the housing and including free forward ends, said support rods engaging and deforming the side edges of a folded newspaper disposed between the support rods with the free lower edges thereof adjacent the screen means.

4,519,379

CONTROL SYSTEM FOR SOLAR HEATERS

Robert T. Schultz, P.O. Box 633, Wrightwood, Calif. 92397

Filed Jun. 24, 1983, Ser. No. 507,337

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—422 **6 Claims**

1. A solar-heating system including:

solar-energy collecting means for collecting energy from a solar-energy source;

transferring means for transferring elsewhere solar-generated heat energy from said solar-energy collecting means; and,

control means for controlling said transferring means, said control means including:

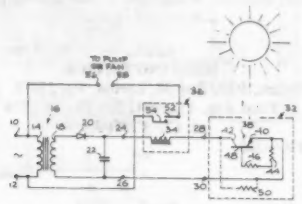
terminal means adapted to receive operating power for said transferring means;

a source of D.C. operating power for said control means;

a relay having a solenoid and at least one pair of normally-open contacts;

a sensor module including a phototransistor having a collector, an emitter and a base;

said sensor module also including a temperature-sensitive resistor coupled between said emitter and said base of said phototransistor;



said collector being coupled through said solenoid to said source of D.C. operating power;

said phototransistor being responsive to solar energy incident thereon to become conductive at a solar energy level dependent upon the magnitude of said temperature-sensitive resistor;

said relay being responsive to conduction by said phototransistor to close said normally open contacts;

said normally open contacts being adapted for serial connection between at least one of said terminal means and said transferring means;

said sensor module being located remotely with respect to said solar-energy collecting means but facing said solar-energy source.

4,519,380

INTERMITTENT THROUGH-FLOW COLLECTOR

Karsten Laing, Herrenstrasse 57, 7500 Karlsruhe, Fed. Rep. of Germany

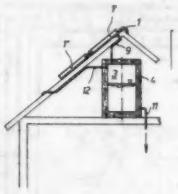
Division of Ser. No. 469,081, Mar. 1, 1983, abandoned, which is a continuation of Ser. No. 123,408, Feb. 20, 1980, abandoned. This application Jun. 21, 1984, Ser. No. 623,532

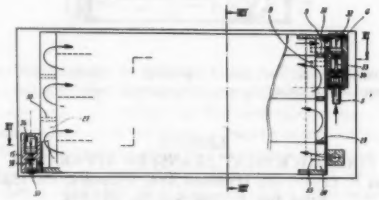
Claims priority, application Austria, Feb. 27, 1979, 1498/79

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—422 **3 Claims**

1. A solar collector system having an absorber element including fluid flow channels therein, a cold water inlet positioned at the vertically lowest point in the absorber and adapted to be connected to a pressurized source of cold water through a cold water inlet valve, and a hot water outlet positioned at the vertically highest point in the absorber and connected with a hot water holding tank leading to a hot water utility circuit positioned vertically lower than said tank whereby said tank maintains operating pressure in said circuit; characterized in that said hot water outlet is in unrestricted communication with said hot water holding tank, in having a temperature sensor in the hot water outlet which opens said inlet valve upon the water temperature in the hot water outlet reaching a predetermined value and which closes said inlet valve when said temperature is below said predetermined value whereby hot water in said channels is intermittently displaced by cold water from said cold water inlet and whereby water pressure within the fluid flow channels of the absorber is independent of the pressure of the cold water of the cold water inlet, and in that said cold water inlet valve includes a valve body positioned at the top of the absorber having a cold water inlet socket connected to said pressurized source, a cold water outlet socket, a movable valve plate separating the cold water outlet socket and the cold water inlet socket, a hot water outlet region connected to the absorber, a hot water





outlet socket connecting said outlet region with said holding tank, a thermal expansion element in said outlet region operatively connected to said valve plate and a hose connecting said cold water outlet socket with said lowest point of the absorber element.

4,519,381

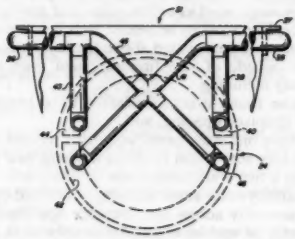
SOLAR HEATING APPARATUS AND METHOD

Gerald J. Tremblay, 7015 Leighton Way, Orlando, Fla. 32807

Filed Feb. 7, 1984, Ser. No. 577,787

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **6 Claims**



1. A solar heating apparatus comprising in combination:

a frame;

a solar collector for collecting and concentrating solar energy, said solar collector being movably mounted to said frame;

solar tracking means for moving said solar collector on said frame during daylight hours responsive to differential heating of a plurality of fluid filled containers located on said solar collector, said solar tracking means having:

a solar collector rotating means attached between said frame and said solar collector and being attached to said solar

tracking means plurality of fluid filled containers for rotating said solar collector on said frame; and

a pair of arcuate cylinders and a pair of pistons located in said solar collector rotating means with each said fluid filled container operatively connected to each said cylinder to apply fluid pressure in each said arcuate cylinder and against each said piston, each piston dividing one arcuate cylinder into two pressure cylinder areas, so that each said piston has a portion of one of said arcuate cylinder's on each side thereof to rotate said solar collector on said frame responsive to a fluid pressure differential.

4,519,382

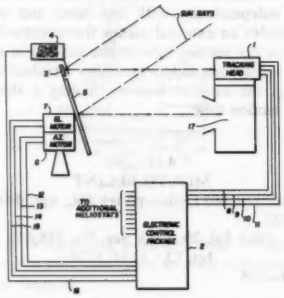
CONTROL SYSTEM FOR HELIOSTATS AND METHOD

Harry L. Gerwin, 14305 Ansted Rd., Silver Spring, Md. 20904

Filed Jun. 14, 1983, Ser. No. 504,350

Int. Cl.³ F24J *3/02*; G01J *1/20*

U.S. Cl. 126—425 **7 Claims**



1. A control system for sequentially controlling the movement of a plurality of heliostats employed in combination with a solar receiver, comprising:

means for controlling the elevational rotational orientation of each heliostat;

means for controlling the azimuthal rotational orientation of each heliostat;

a tracking mirror operatively associated with each heliostat;

tracking means operatively associated with the solar receiver and arranged to receive reflected sun rays from each tracking mirror sequentially, said tracking means including transducer means for generating signals indicative of both the relative elevational and azimuthal rotational orientation of the heliostat being sequenced; and

control means connected sequentially to the means for controlling the elevational rotational orientation of each heliostat, the means for controlling the azimuthal rotational orientation of each heliostat, and the tracking means, said control means receiving the signals generated by the transducer means and generating control signals for activating the means for controlling the elevation rotational orientation of each heliostat, and the means for controlling the azimuthal rotational orientation of each heliostat, to thereby adjust the relative elevational rotational and relative azimuthal rotational position of each heliostat, so that sun rays reflected by the heliostat are received by the solar receiver, wherein:

(i) the transducer means comprises four solar sensors arranged in any array on the perimeter of the image of a sun ray received by the tracking means, such that two of said sensors are displaced along a horizontal axis to generate a signal related to aximuth orientation of the heliostat being sequenced and the other two of said sensors are displaced along a vertical axis to generate a signal related to elevational orientation of the heliostat being sequenced;

(ii) said control means including:

a tracking generator board connected to the tracking means;

a power board connected to the tracking generator board, to the means for controlling the elevational rotational orientation of each heliostat, and to the means for controlling the azimuthal rotational orientation of each heliostat;

a commutator board connected to the tracking generator board and to the power board; and

a system clock connected to the tracking generator board and to the commutator board;

(iii) the tracking generator board when activated by the system clock generates tracking drive activation signals from the transducer generator signals, said tracking drive activation signal being applied to said power board which generates the control signal for activating the means for controlling the elevational rotational orientation of each heliostat and the means for controlling the aximuthal rotational orientation of each heliostat; and

(iv) the commutator board controls the generation of said tracking drive activation signal by the tracking generator board in sequence among the heliostats.

4,519,383

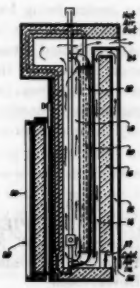
ANTI-REVERSE SIPHON SOLAR HEATING SYSTEM

William J. Larkin, 432 Begonia, Corona del Mar, Calif. 92625

Filed Mar. 30, 1984, Ser. No. 595,485

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—430 **7 Claims**



1. An anti-reverse siphon fluid heating system for heating a fluid mass comprising:

(a) a continuous fluid flow passageway, comprising, in downstream order,

(i) an ascending passageway having at the bottom thereof an inlet from said fluid mass;

(ii) a descending passageway communicating at its top to the top of said ascending passageway through an inversion loop, an insulation positioned between said ascending and descending passageways for thermallly insulating said descending passageway from said ascending passageway;

(iii) an ascending heating chamber communicating with the bottom of said loop, and having a hot fluid outlet at the top thereof for communicating with said fluid mass to deliver hot fluid thereinto;

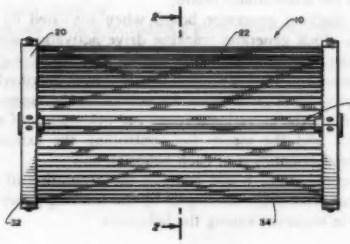
(b) a heating element heated by energy derived from the sun and disposed in said heating chamber, whereby while said heating element heats fluid in said chamber, natural convection forces hot fluid through said outlet, and when said heating element is dormant, pressure heads in said ascending and descending passageways block reverse circulation of the system.

4,519,384

CONCENTRATING SOLAR BEAM COLLECTOR

R. Michael Murtha, 10965 Del Norte #210, Ventura, Calif. 93004

Filed May 14, 1984, Ser. No. 609,701
Int. Cl.³ F24J 3/02
U.S. Cl. 126—438 **9 Claims**



1. A concentrating solar beam collector comprising:

a frame;

a louvered panel assembly including a louvered panel forming an upper surface and a louvered panel forming an under surface mounted on said frame and defining an interior enclosed area, said louvered panels including a plurality of spaced louvers having light reflective surfaces; and

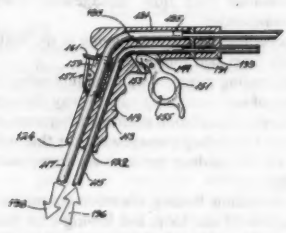
an energy converting device mounted on said frame, said energy converting device being located within said enclosed area, said louvered panels being situated so that some light rays are reflected from the surface of said louvers of the upper surface of the energy converting device while other light rays pass between the spacing of the louvers forming the upper surface and are reflected by the louvers forming the under surface of the energy converting device.

4,519,385

LAVAGE HANDPIECE

Robert W. Atkinson, Dover; Joseph W. Elliott, and Donald W. Johnson, both of Minerva, all of Ohio, assignors to Snyder Laboratories, Inc., Dover, Ohio

Filed Dec. 1, 1982, Ser. No. 445,807
Int. Cl.³ A61H 9/00; A61M 1/00
U.S. Cl. 128—66 **21 Claims**



1. A medical lavage handpiece having a suction line, the handpiece comprising:

(a) a housing having a depending grip portion and an extending forward facing portion;

(b) a compressible irrigation tube having a first end for connecting to an external irrigant liquid source and a second end in fluid communication with said first end for providing an outlet means for the irrigant liquid;

(c) a chamber means within the housing for receiving the irrigation tube;

(d) a slot in the housing extending from an outer surface of the housing and communicating with said chamber; and

(e) a manually operable trigger means for pivoting in said slot and for engaging said tube for controlling the flow of fluid in said irrigation tube,

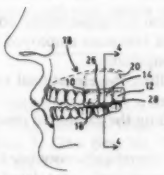
wherein said handpiece further includes a compressible suction tube having a first end for connecting to an outside suction source, and a second end in fluid communication with said first end for providing an inlet means for the flow of suction, said suction tube including a clamping means for controlling the suction flow through the suction tube, and wherein the irrigation control trigger includes a finger gripping portion, said handpiece being operable by an operator holding the grip portion with one hand, said irrigation control trigger being operable with a finger of the one hand and said clamping means for the suction tube being operable with the thumb of the one hand, said trigger and clamping means being positioned on the handpiece to facilitate operation of both simultaneously or independently with one hand, and wherein said housing includes an external means for selectively attaching and detaching the suction tube to the outside of the housing, comprising at least one support member attached externally to said housing, the support member having a slot therein to receive the suction tube.

4,519,386

MOUTH SPLINT

Ashley H. Sullivan, 401 Gallaher View Rd., Apt. #46, Knoxville, Tenn. 37923

Filed Jul. 29, 1983, Ser. No. 518,617
Int. Cl.³ A61F 5/56
U.S. Cl. 128—136 **15 Claims**



1. A concealed resilient and flexible mouth splint for placing in the mouth of an individual around the upper maxillary posterior teeth to effect the tonus of the masticator muscles of the individual comprising:

a left channel shaped member and a right channel shaped member made of a resilient and flexible non-toxic material, said left and right channel members for fitting over the left first molar and the right first molar, respectively, each of said left and right channel members having a biting member with a top and bottom side, said top side being molded to conform with the biting surface of said first molars, each of said left and right channel members having an inner wall integrally joined with said biting portion and molded to conform to the interior lateral surface of said first molars, and each of said left and right channel members having an outer wall intrigally joined with said biting portion and molded to conform to the exterior lateral surface of said first molar; and

a palate member made of said resilient and flexible material arching between and integrally joined with said inner wall of said left channel member and said inner wall of said right channel member, said palate member being molded to conform with the roof of the mouth of an individual wearing said mouth splint, said biting portion of said left and right channel member including a sufficient amount of said flexible and resilient material to maintain said top and bottom sides of said biting portion spaced a selected dis-

tance by said biting portion of said left and right channel members, and such that an air way is maintained through the mouth of the wearer.

4,519,387

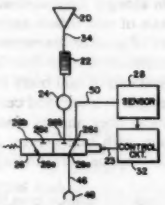
RESPIRATING GAS SUPPLY METHOD AND APPARATUS THEREFOR

Gerald Durkan, Altoona, Pa., and Leonard M. Sieracki, Columbia, Md., assignors to Kircaldie, Randall and McNab, trustee, Wethersfield, Conn.

Division of Ser. No. 446,542, Dec. 3, 1982, Pat. No. 4,462,398. This application Jun. 22, 1984, Ser. No. 623,594

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.23 **6 Claims**



1. A method of supplying a fixed volume of supplemental respirating gas per unit time to an in vivo respiratory system comprising the steps of:

(a) predetermining a volumetric flow rate R_1 of said supplemental respirating gas;

(b) predetermining the time duration T_1 of each application of said supplemental respirating gas to said to vivo respiratory system, said time duration T_1 being less than an inspiration period having a duration T_2 during which negative pressure relative to ambient pressure exists in said in vivo respiratory system at the location whereat respirating gas is introduced to said system; said rate R_1 being set at a value such that it produces at least as great a rise in the partial pressure of said gas in blood interfacing with said respiratory system as a continuous application of said gas at a lower rate R_2 for the duration T_2;

(c) predetermining said required minimum delay interval between successive applications of said gas at the rate R_1 to said in vivo respiratory system;

(d) connecting said in vivo respiratory system to sensing means;

(e) using said sensing means to sense negative pressure at the beginning of inspiration in said in vivo respiratory system;

(f) determining if said sensing of negative pressure in said vivo respiratory system occurs within said delay interval preceding the next application of said gas to said in vivo respiratory system;

(g) connecting said in vivo respiratory system to a supply of gas for the time duration T_1 only if said sensing of negative pressure in said in vivo respiratory system does not occur within said delay interval, said connection facilitating an application of said gas to said in vivo respiratory system;

(h) reconnecting said in vivo respiratory system to said sensing means after an application of said gas to said in vivo respiratory system; and,

(i) repeating steps (e) through (h) for a plurality of consecutive inspiration periods, whereby no greater volume of supplemental respirating gas than said fixed volume is supplied to said in vivo respiratory system during a unit of time.

4,519,388

RESPIRATOR APPARATUS AND METHOD OF OPERATION THEREOF

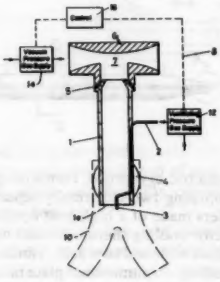
Erik Schwanbom, Lübeck; Horst Frankenberger, Bad Schwartau, both of Fed. Rep. of Germany, and Marcel Baum, Vienna, Austria, assignors to Drägerwerk A.G., Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,386

Claims priority, application Fed. Rep. of Germany, May 19, 1981, 3119814

Int. Cl.³ A61M *16/00*

U.S. Cl. 128—204.25 **3 Claims**



1. A respirator device for use in a patient's trachea comprising:

a tracheal tube (**1**) having one open end (**1***a*) adapted for insertion into a person's trachea, and an opposite open end (**5**);

a line (**2**) for ventilating gas extending into said tracheal tube and terminating in a jet nozzle (**3**) directed out of said tube one open end (**1***a*) into the person's trachea;

ventilating gas supply means (**12**) connected to said jet nozzle via said line (**2**) for supplying ventilating gas in gas jet pulses having a frequency above 300 cycles per minute during an inspiration phase of said respirator device;

an extension piece (**6**) defining a through passage therethrough having an input end, an output end and an intermediate necked down portion (**7**), said output end communicating with the atmosphere, said opposite open end of said tracheal tube connected to said extension piece between the input and output ends and substantially perpendicular thereto and said extension piece defining a connecting passageway extending between the interior of said trachea tube at said opposite open end (**5**) and said necked down portion (**7**) of said extension piece through passage, said through passage shaped so that when pressurized gas is applied to said input end a vacuum appears in the interior of said opposite open end (**5**) of said trachea tube (**1**);

vacuum pressure gas supply means connected to said extension piece and communicating with said input end of said through passage for supplying gas pulses for producing vacuum pulses in the interior of said opposite open end of said tracheal tube (**5**); and

control means connected to said vacuum pressure gas supply means and to said ventilating gas pressure means for synchronizing vacuum pulses with jet gas pulses through said jet nozzle in such a way that a jet gas pulse or a series of jet gas pulses is followed by a vacuum pulse, and for controlling said vacuum pressure gas supply means for producing vacuum pulses with frequencies ranging from 10 to 1,000 cycles per minute.

4,519,389

THERMOELECTRIC CRYOPROBE

Timofei S. Gudkin, ulitsa Dibenko, 23, korpus 5, kv. 92; Evgeny K. Iordanishvili, prospekt Morisa Toreza, 40, korpus 4, kv. 35, both of Leningrad; Nikolai S. Lidorenko, ulitsa Kibalchicha, 2, korpus 1, kv. 217, Moscow; Bella E. Malkovich, prospekt Morisa Toreza, 102, korpus 2, kv. 13; Mikhail I. Razumovsky, prospekt Smirnova, 71, kv. 15, both of Leningrad, and Igor B. Rubashov, ulitsa Novo-Alexeevskaya, 1, kv. 151, Moscow, all of U.S.S.R.

PCT No. PCT/SU81/00028, § 371 Date Nov. 8, 1982, § 102(e) Date Nov. 8, 1982, PCT Pub. No. WO82/03169, PCT Pub. Date Sep. 30, 1982

PCT Filed Mar. 23, 1981, Ser. No. 442,223

Int. Cl.³ A61B *17/36*

U.S. Cl. 128—303.1 **20 Claims**

1. A thermoelectric cryoprobe, comprising:

a handle comprising two electrically separated longitudinal half-cylinders made of a high heat conduction material;

a semiconductor cooling thermoelement having a hot junction in contact with said two half-cylinders, said thermoelement including a commutation plate mounted on one end of said handle and in direct contact with the latter by said hot junction, the height of said thermoelement does not exceed its radius, and said commutation plate having a functional surface which is a working surface of said thermoelectric cryoprobe;

a heat sink for removal of heat from said semiconductor cooling thermoelement, said heat sink comprising said two electrically separated longitudinal half-cylinders forming part of said handle; and

means for feeding current to the longitudinal half-cylinders of said handle.

4,519,390

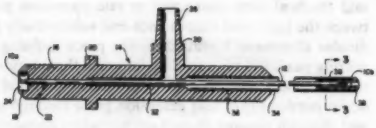
FIBER OPTIC LASER CATHETER

Kenneth J. Horne, Kaysville, Utah, assignor to HGM, Inc., Salt Lake City, Utah

Filed Oct. 15, 1982, Ser. No. 438,041

Int. Cl.³ A61N *5/06*; A61B *17/36*

U.S. Cl. 128—303.1 **1 Claim**



1. In a laser system having a laser providing in a cylindrical female connector fitting a focused laser beam, apparatus for communicating said beam from its source in said fitting to a medical treatment site, comprising:

(a) an optical fiber assembly, comprising:

(i) a continuous length of optical fiber of at least 600 microns in diameter extending between a proximal input end and a distal output end;

(ii) continuous cladding surrounding said fiber between substantially short unclad end portions at the proximal input and distal output ends thereof; and

(iii) a continuous flexible tube providing a sheath over a major portion of the length of said fiber and cladding;

(b) an integral plastic molded connector having;

(i) a cylindrical body with one cylindrical end, designated the proximal end, formed to fit within said cylindrical female laser connector fitting with the opposite end of said body being designated as its distal end;

(ii) an annular collar formed around said body and spaced from its proximal end a first distance corresponding to the proper depth of insertion of said cylindrical body proximal end into said cylindrical female laser connector fitting;

(iii) a cylindrical open-ended, inwardly-extending cavity formed in said body proximal end concentric with the axis of said body;

(iv) a first bore concentric with the axis of said body extending from a base portion of said cavity for a second distance substantially equal to the said first distance, said proximal end of said fiber and cladding being snugly fitted and secured within said first bore with the proximal unclad end portion of said fiber extending into said cavity for a third distance less than the depth of said cavity selected to allow said unclad fiber to be self-supporting therein along a fixed axis substantially coinciding with the axis of said first bore;

(v) a second bore of greater diameter than said first bore forming an extension of said first bore and extending toward the distal end of said body for a fourth distance equal to the length of a selected central portion of said body, said optical fiber and its cladding being loosely mounted therein with said greater diameter providing coolant gas flow space surrounding said optical fiber and cladding;

(vi) a formed cylindrical tubular port structure concentric with an axis perpendicular to the axis of said body and extending outwardly from said central portion thereof, said port structure forming an outlet communicating with said second bore and adapted for receiving a tubular connection to a source of coolant gas for flowing said gas into said second bore to cool the said optical fiber and cladding mounted therein;

(vii) a third bore forming a continuation of said second bore and concentric with the axis of said body, said third bore being of greater diameter than said second bore and having a length of the proximal end of said tube sheath secured therein and another portion of said optical fiber and cladding loosely mounted therein whereby coolant gas introduced into said second bore may flow into said third bore and within said tube sheath to cool the remaining portion of said optical fiber and cladding enclosed by said sheath and extending to the distal end thereof; and

(c) an integral plastic molded cylindrical collet secured in the said distal end of said sheath, said collet having a bore extending therethrough and being slotted to permit flow of coolant gas therethrough, the distal end of said optical fiber and cladding being secured in said outlet with the unclad distal end of said optical fiber being mounted and self-supported at a position recessed within the bore of said collet.

4,519,391

ENDOSCOPE WITH SIGNAL TRANSMISSION SYSTEM AND METHOD OF OPERATING SAME

Makoto Murakoshi, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 28, 1982, Ser. No. 425,463

Claims priority, application Japan, Oct. 20, 1981, 56-167568

Int. Cl.³ A61B *17/39*

U.S. Cl. 128—303.15 **16 Claims**

1. An endoscope system having a viewing head connected to an elongated sheath comprising:

an electrical instrument;

a high frequency current source electrically connected to said electrical instrument to drive said instrument;

imaging means provided in said viewing head for picking up

an image to produce a video signal representative of the image;

frequency modulator means interconnected to said imaging means for generating a carrier wave having a frequency band substantially different from a frequency band of the current produced from said current source, said modulator means frequency modulating the carrier wave with the video signal to produce a frequency modulated signal;

visualizing means responsive to the frequency modulated signal developed by said frequency modulator means for visualizing the video signal by reproducing the picked up image on a display; and

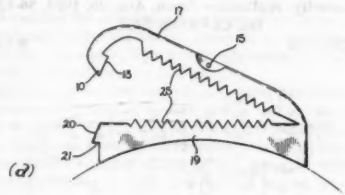
transmission means provided in said sheath for transmitting the frequency modulated signal from said frequency modulator means to said visualizing means.

4,519,392

HEMOSTASING MUSCLE CLIPS FOR NEEDLELESS SURGERY

Robert W. Lingua, 3246 Alabama St., La Crescenta, Calif. 91412

Filed Oct. 12, 1982, Ser. No. 433,800
Int. Cl.³ A61B *17/12*
U.S. Cl. 128—325 **16 Claims**



1. An extraocular muscle clip system comprising:

(i) a first and second elongated clip, each clip comprising:

(a) a hinge means at one end;

(b) a pair of oppositely facing jaws, said jaws being interconnected at said hinge means and having opposed faces surfaced with a muscle grabbing means, at least one of said jaws having an exterior surface adjacent the eye in use, said exterior surface being arcuately shaped to substantially conform to the curvature of the eye; and

(c) an open end with a locking means whereby said jaws may be closed thereby securely clamping onto said muscle; and,

(ii) a connecting means for connecting said first and second clips together.

4,519,393

FITTING FOR CORRUGATED TUBE

Roger J. Elgas, Littleton, and Timothy M. Gordon, Morrison, both of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Apr. 26, 1982, Ser. No. 371,979
Int. Cl.³ A61F *7/00*
U.S. Cl. 128—400 **2 Claims**

1. A blood heater comprising

a casing having blood inlet means and blood outlet means and a hole through it, said casing providing a blood flow path from said inlet means to said outlet means,

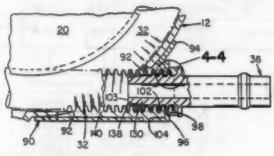
a helically corrugated tube made of heat conductive material within said casing, and having an end passing through said hole,

a tubular member having an end adapted for connection to a source of heated fluid and an end with external helical threads formed on it connected to an end of said tube,

said threads being sized to provide a small clearance with the interior surface of said corrugated tube,

first potting material filling the voids between said threads and said interior surface,

a seal cover means having a flange conforming to the outside



surface of said casing surrounding said hole and an extending portion that ends near said end of said tube and has a hole through which said helically corrugated tube and tubular member pass, and

second potting material sealing said outside surface surrounding said hole, said exterior surface of said tube, and the interior surface of said cover means to each other,

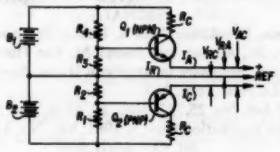
said end of said helically corrugated tube being positioned outside of said blood flow path to direct any heated liquid leaking between said corrugated tube and tubular member outside of said casing.

4,519,394

METHOD AND APPARATUS FOR CATHODIC POTENTIAL CONTROL IN ELECTRICALLY INDUCED OSTEOGENESIS

Jonathan Black, King of Prussia, and Thomas J. Baranowski, Jr., Philadelphia, both of Pa., assignors to Trustees of the University of Pennsylvania, Philadelphia, Pa.

Filed Mar. 7, 1983, Ser. No. 472,567
Int. Cl.³ A61N *1/20*
U.S. Cl. 128—419 F **10 Claims**



1. A method of stimulating osteogenesis at a tissue site in living tissue internal to a skin surface, said method comprising the steps of:

providing an anode, a cathode, and a reference electrode;

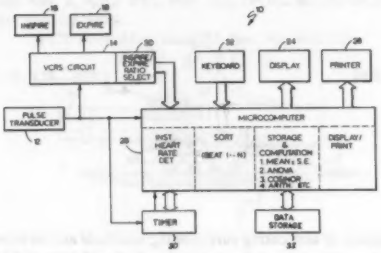
locating said cathode at said tissue site, said anode in contact with said living tissue and said reference electrode in contact with said living tissue remote from said tissue site; and

applying a direct current from said cathode to said anode and maintaining a potential between said cathode and said reference electrode substantially constant.

4,519,395
MEDICAL INSTRUMENT FOR NONINVASIVE MEASUREMENT OF CARDIOVASCULAR CHARACTERISTICS

William J. M. Hrushesky, 5049 Colfax Ave. South, Minneapolis, Minn. 55419

Filed Dec. 15, 1982, Ser. No. 450,066
Int. Cl.³ A61B 5/02
U.S. Cl. 128—671 35 Claims



1. An apparatus for noninvasive quantitative measurement of characteristics of a cardiovascular system of a human object, the instrument comprising:

noninvasive pulse transducer means for providing signal pulses representative of sensed heart beats of the human subject;

voluntary cardiorespiratory synchronization means responsive to the signal pulses for providing stimulae which permit the human subject to voluntarily synchronize the subject's respiratory cycles with the subject's heart beats;

instantaneous heart rate measurement means responsive to the signal pulses for providing digital data representative of instantaneous heart rate at each heart beat of a plurality of N-beat voluntarily synchronized respiratory cycles;

data sorting means for sorting the digital data by each of N-beat categories;

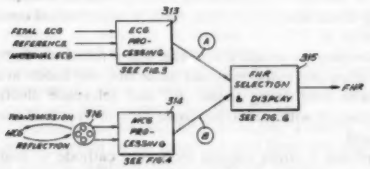
data analysis means for analyzing the sorted digital data to derive a digital value indicative of a characteristic of the subject's cardiovascular system; and

output means for providing a human perceivable output as a function of the derived digital value.

4,519,396
FETAL HEART RATE MONITOR APPARATUS AND METHOD FOR COMBINING ELECTRICALLY AND MECHANICALLY DERIVED CARDIOGRAPHIC SIGNALS

Paul Epstein, Brookline; John S. Ballas, Jr., Newton; John J. Mandler, Jr., Allston, and Joseph M. Van Horn, Cambridge, all of Mass., assignors to American Home Products Corporation (Del.), New York, N.Y.

Division of Ser. No. 25,720, Mar. 30, 1979, Pat. No. 4,299,234. This application Nov. 5, 1981, Ser. No. 318,338
Int. Cl.³ A61B 5/02
U.S. Cl. 128—698 4 Claims



1. The method of generating an output signal indicative of the rate of fluctuation of a human fetal heart, comprising the steps of:

(A) coupling an input electrocardiographic signal from a fetus-carrying female human;

(B) processing said electrocardiographic signal to produce a first electric signal indicative of the rate of fluctuation of the heart of said fetus;

(C) coupling an input mechanical cardiographic signal from said human;

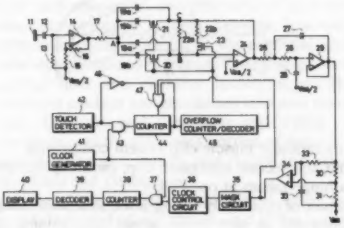
(D) processing said mechanical cardiographic signal to produce a second electric signal indicative of the rate of fluctuation of the heart of said fetus; and

(E) interdependently processing both said electric signals to produce an enhanced output signal, relative to at least one of said electric signals, indicative of said fetal heart rate.

4,519,397
PULSE DETECTOR

Junichi Tabata, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Fed. Rep. of Germany

Filed Jul. 30, 1982, Ser. No. 403,427
Claims priority, application Japan, Aug. 26, 1981, 56-133573
Int. Cl.³ A61B 5/02
U.S. Cl. 128—706 9 Claims

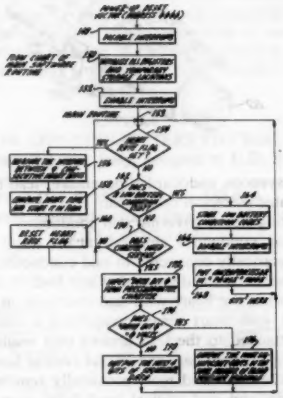


1. In a pulse detector of the type having a pulse detecting portion having an electrocardiac potential sensing electrode for sensing electrocardiac potentials, an amplifier for amplifying electrocardiac potential signals derived from said electrocardiac potential sensing electrode, a filter for eliminating noise and being connected to said amplifier, and a voltage comparator for detecting electrocardiac potentials higher than a predetermined potential level and producing corresponding output signals; a signal processing circuit connected to said voltage comparator for processing the output signals and producing processed output signals; and a display responsive to the processed output signals for indicating a pulse rate; the improvement comprising timer means connected to said voltage comparator and operable when enabled to effect a change of the filter characteristics of said filter if an electrocardiac potential higher than said predetermined potential level is not detected within a preselected giver time, said timer means including a clock generator for producing a clock signal, and a counter for counting said clock signal and having a reset terminal connected to receive the output signals from said voltage comparator; and enabling means for enabling said timer means.

4,519,398
METHOD AND APPARATUS FOR LONG-TERM MONITORING OF PHYSIOLOGICAL ACTIVITY TO PROVIDE A COMPACT PORTABLE RECORD

Andrew I. Lisiecki, Irvine, and Alan S. Wong, Escondido, both of Calif., assignors to Del Mar Avionics, Irvine, Calif.

Continuation of Ser. No. 55,384, Jul. 9, 1979, abandoned. This application Jan. 21, 1982, Ser. No. 341,309
Int. Cl.³ A61B 5/04
U.S. Cl. 128—710 8 Claims

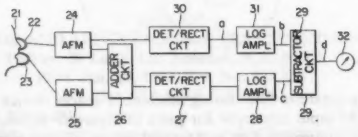


1. A method for creating a long term chronology of a physiological parameter of a patient comprising the steps of:
coupling a portable, lightweight apparatus to said patient;
coupling transducers to said patient;
intermittently sensing said physiological parameter through transducers coupled to said patient and to said apparatus;
intermittently storing said physiological parameter sensed in a solid state memory included in said apparatus; and
intermittently storing a time-of-day signal in said memory corresponding to each one of said stored physiological parameters;
selectively ceasing said storing of said physiological parameter upon a power reduction; and
continuing said storing of said time-of-day signal during said power reduction,
whereby said chronology of patient's physiological parameters is created.

4,519,399
METHOD FOR MEASURING THE DEGREE OF NASALITY

Kiyoharu Hori, Hino, Japan, assignor to Rion Kabushiki Kaisha, Japan

Filed Dec. 2, 1983, Ser. No. 557,536
Claims priority, application Japan, Dec. 13, 1982, 57-218210
Int. Cl.³ A61B 5/00
U.S. Cl. 128—724 8 Claims

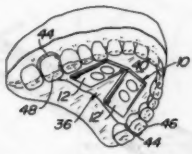


1. Apparatus for measuring the degree of nasality in human voice sounds comprising means for independently isolating and measuring without leakage the exhaled air flow rate through the nose and the exhaled air flow rate through the mouth of a person resulting from a phonation, and means for determining the degree of nasality by comparing the air flow rates.

4,519,400
METHOD FOR STIMULATING SALIVATION

Henry S. Brenman, Cinnaminson; Philip Katz, Princeton Junction, both of N.J., and Graydon E. Beatty, Philadelphia, Pa., assignors to Biosonics, Inc., Philadelphia, Pa.

Filed Apr. 1, 1983, Ser. No. 481,331
Int. Cl.³ A61B 5/05; A61N 1/36
U.S. Cl. 128—741 4 Claims

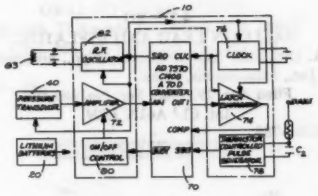


1. A method for stimulating salivation, comprising the steps of locating and stimulating the nerves of the oral cavity of a user to identify areas which are sensitive to neural stimulation by electrical means, placing in the oral cavity of the user means for generating and applying a stimulating signal directly to said areas, and applying said signal directly to at least one of said areas.

4,519,401
PRESSURE TELEMETRY IMPLANT

Wen H. Ko, Cleveland, Ohio, and Albert M. Leung, Kitchener, Canada, assignors to Case Western Reserve University, Cleveland Heights, Ohio

Filed Sep. 20, 1983, Ser. No. 534,094
Int. Cl.³ A61B 5/00
U.S. Cl. 118—748 19 Claims



1. Apparatus for monitoring intacranial pressure in a subject, said apparatus comprising:
a pressure transducer for monitoring pressure variations and producing an analog electronic signal output related to said pressure variations;
means for coupling a fluid pressure from an intracranial cavity to said transducer;
transmitter means having an analog to digital converter for converting said analog electronic signal output from said transducer into a sequence of digitial data pulses to encode said pressure into a communication signal suitable for transmission to a remote receiver, said transmitter including switching means responsive to an external signal for switching said transmitter from a quiescent low power state to a higher power transmit state and circuitry coupled to said analog to digital converter for modulating the time between transmission of said sequence of digital data

pulses in response to variations in temperture in a region of said pressure transducer; and

means for hermetically encapsulating said transducer and said transmitter means having a through passage to accommodate said means for coupling.

4,519,402

SYRINGE FOR COLLECTING A LIQUID SAMPLE

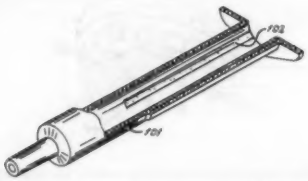
Jorgen Anderseu, Herlev, Denmark, assignor to Radiometer A/S, Copenhagen, Denmark

Filed Aug. 26, 1983, Ser. No. 526,899

Claims priority, application Denmark, Aug. 27, 1982, 3855/82

Int. Cl.³ A61B *5/14*

U.S. Cl. 128—765 **8 Claims**



1. A syringe for collecting a liquid sample comprising a syringe cylinder having an end wall defining a sample inlet passage, and a piston having a peripheral contact surface sealingly engaged with the inner surface of the cylinder, the piston being displaceable between a sampling position in which the piston is axially spaced from the cylinder end wall so as to define a sample collecting chamber within the cylinder, and a position closer to said cylinder end wall, the inner cylinder surface including a surface part which comprises a material pervious to gas and impervious to liquid and which extends axially across the contact surface of the piston when the piston is in its sampling position, so as to define at least one venting passage for the sample collecting chamber at at least one axial position of the piston.

4,519,403

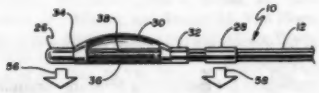
BALLOON LEAD AND INFLATOR

Eugene A. Dickhudt, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 29, 1983, Ser. No. 489,882

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—785 **8 Claims**



1. A lead for insertion in the epidural space comprising:

an elongated lead body having a longitudinal axis;

a conductor mounted longitudinally within the leady body;

an electrode mounted on the lead body and conductively connected to the conductor;

inflatable means mounted on the lead body for expansion away from the lead body in a first direction so that contact with walls of the epidural space imparts a net force in a second direction transverse to the longitudinal axis, thereby urging the electrode in the second direction; and

means for passing fluid through the lead body for inflating the inflatable means.

4,519,404

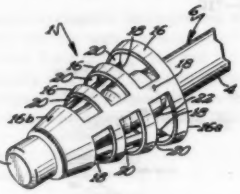
ENDOCARDIAL ELECTRODE LEAD WITH CONICAL FIXATION MECHANISM

John J. Fleischhacker, 16631 Meadowbrook La., Wayzata, Minn. 55391

Filed Sep. 28, 1983, Ser. No. 537,252

Int. Cl.³ A61N *1/04*

U.S. Cl. 128—785 **17 Claims**



1. A transvenous, endocardial pacemaker lead comprising:

an elongated electrical conductor;

an insulating sleeve covering said conductor;

an exposed, conductive electrode at the distal end of said lead electrically connected to said conductor;

fixation means on the distal end of said lead for holding said lead within the heart with said electrode in conductive contact with heart tissue, comprising a conical shaped head attached to the lead around said insulating sleeve with the enlarged base end of said conical head being the portion of said head most proximally remote from said electrode, and said conical head being comprised of a plurality of rings of successively smaller diameter longitudinally spaced along the length of said lead with said rings decreasing in diameter in a direction from said base end towards said electrode, and a plurality of ribs circumferentially spaced around said rings and interconnected thereto, said ribs extending generally lengthwise of said conical head between said rings, whereby said conical head may be secured within the heart by the catching engagement of said rings with trabeculae of the heart.

4,519,405

SPACER DEVICE FOR FILTER FITTING MACHINE

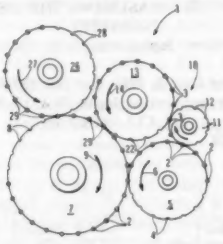
Enzo Seragnoli, Bologna, Italy, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Jul. 15, 1982, Ser. No. 398,544

Claims priority, application Italy, Aug. 7, 1981, 49073 A/81

Int. Cl.³ A24C *5/32, 5/35*

U.S. Cl. 131—94 **9 Claims**



1. In a cigarette filter fitting machine, a spacer device comprising an input conveyor for pairs of cigarette pieces, each said pair comprising first and second axially aligned cigarette pieces arranged on the input conveyor transversely of a direction of advancement of said input conveyor and in substantially end-to-end contact with one another; an output conveyor for

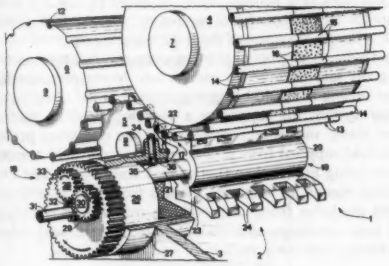
said pairs of aligned cigarette pieces, said output conveyor being tangential to said input conveyor and having means to support first and second cigarette pieces at a predetermined distance from one another axially aligned in pairs; a conveyor chain means extending from an input position on said input conveyor to a portion of said output conveyor adjacent to a zone on said output conveyor tangent to the input conveyor, with the input position bring upstream of said tangency zone; said conveyor chain defining a portion of an advancement path of said first cigarette pieces only between said input and output conveyors and comprising at least a first and a second conveyor substantially tangential to one another; said first conveyor being tangential to said input conveyor, and one of said first and second conveyors being a cigarette piece spacer conveyor; and cigarette piece translation means on said spacer conveyor to axially displace said cigarette pieces a predetermined distance relative to the spacer conveyor itself.

4,519,406

DEVICE FOR APPLYING FILTERS TO CIGARETTES

Riccardo Mattei, Bologna, Italy, assignor to G.D. Società per Azioni, Bologna, Italy

Filed Dec. 9, 1983, Ser. No. 559,826
Claims priority, application Italy, Dec. 22, 1982, 3630 A/82
Int. Cl.³ A24C *5/52*
U.S. Cl. 131—94 **9 Claims**



1. A device for applying filters to cigarettes, comprising a conveyor roller provided with a plurality of uniformly distributed peripheral axial seats arranged to each receive a respective group comprising at least one cigarette and a relative filter element which are axially aligned with each other, and a rolling device cooperating with each of said groups at a rolling station in order to cause the group to roll along a peripheral surface of said roller, characterised in that said rolling device comprises a support member rotatable about a first axis, a support element mounted on said support member and rotatable about a second axis parallel and eccentric to said first axis, a rolling element, extending from said support element and uniformly distributed about said second axis, comprising at least two rolling plates extending therefrom, whereby one rolling plate can retain the cigarette and filter groups against the conveyor roller at the rolling station while at least one other rolling plate may be cleaned, and transmission means interposed between said first and said second axis in order to rotate said support element about said second axis in response to a rotation of said support member about said first axis.

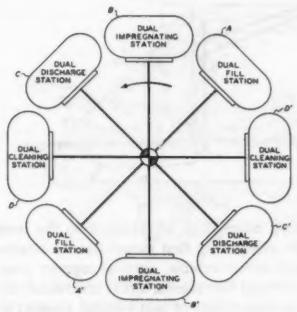
4,519,407

METHOD AND APPARATUS FOR TREATING TOBACCO

John A. Hellier, 20 Leslie La., Katonah, N.Y. 10563

Filed Jun. 13, 1983, Ser. No. 503,932
Int. Cl.³ A24B *3/18*
U.S. Cl. 131—291 **18 Claims**

1. Tobacco treating apparatus comprising a rotary structure, a series of tobacco containers mounted on said rotary structure in circumferentially spaced relation to each other, means for turning said rotary structure incrementally step by step, means forming a series of operating stations in locations spaced circumferentially around said rotary structure, said stations including in circumferential succession a filling station, an impregnating station, a discharge station, and a cleaning station, said stations being so located with respect to said containers on said rotary structure that as said rotary structure turns to carry one container from said filling station to said impregnating station another container will be carried from said impregnating station to said discharge station and another container will be carried from said discharge station to said cleaning station



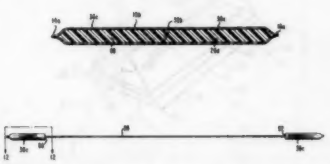
and so on, each of said containers being an open top container adapted to receive a load of tobacco when at said filling station, means for applying a pressure-tight cover to a container at said impregnating station, means for introducing an impregnating medium into said the covered container at said impregnating station, means for removing the cover from the container at said impregnating station after an interval of treatment by said impregnating medium, means for removing the treated tobacco from a container at said discharge station, and means for cleaning the empty container at said cleaning station to make it ready to receive a new load of tobacco.

4,519,408

ORAL HYGIENE DEVICE

Norman Charatan, 22 Varady Dr., Fords, N.J. 08863

Filed Jun. 24, 1983, Ser. No. 507,220
Int. Cl.³ A61C *15/00*
U.S. Cl. 132—89 **8 Claims**



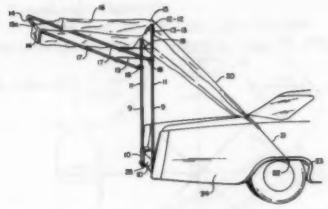
1. An oral hygiene device comprising a unitary housing, said housing defining a cavity therewithin, means to separate said housing into at least two portions, a flexible elongatable material, said material being permanently elongated once said material is stretched, said material completely filling said cavity when unelongated, said material having a pair of ends, one of said pair ends being secured within said cavity to one of said at least two portions of said housing, the other of said pair of ends being secured within said cavity to another of said at least two portions of said housing, said material being elongatable so as to have an exposed length equal to the distance separating said two portions when said housing is separated.

4,519,409

AWNING ADAPTED TO BE ATTACHED TO BUMPER OF AUTOMOBILE

Roger D. Kinney, Gahanna, and Raymond J. Federowicz, Reynoldsburg, both of Ohio, assignors to Topper International Enterprises, Gahanna, Ohio

Filed Jun. 13, 1983, Ser. No. 504,009
Int. Cl.[3] A45F 1/14
U.S. Cl. 135—88 5 Claims



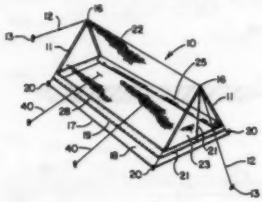
1. An awning adapted to be attached to the bumper of a motor vehicle, comprising first means fixedly attached to the bumper of said motor vehicle, vertical support posts removably attached to said first means, a first horizontal support rod attached to the upper ends of said vertical support posts, said support rod being removably attached to an awning, cantilevered vertically adjustable rods atached to said vertical support posts and extending at right angles to said bumper plane, a second horizontal support rod attached to the outer ends of said cantilevered vertically adjustable rods, said second horizontal support rod being removably attached to the outer end area of said awning, said awning's opposite end being provided with means for removable attachment to said motor vehicle's wheel wells.

4,519,410

TENT CONSTRUCTION

Steven R. Kubacki, 33 Mountain Rd., South Deerfield, Mass. 01373

Filed Oct. 14, 1983, Ser. No. 541,861
Int. Cl.[3] A45F 1/00, 1/10
U.S. Cl. 135—93 7 Claims



1. A tent comprising when erected:

a. an open mesh of screen-like material enclosure of interconnected side walls and end walls forming a tent, fastened at a first lower edge to a border element constructed to be fastened to a substrate, such as the ground;

b. a weather resistant enclosure of interconnected side walls, end walls, and having a second lower edge, said walls erectable as a tent within the open mesh enclosure by connection and support means within the open mesh enclosure, the second edge of the weather resistant enclosure being fastenable to the border element; and

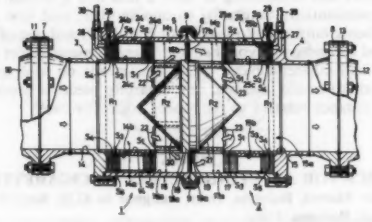
c. a frame means for supporting the enclosures in erected position.

4,519,411

EMERGENCY DISCONNECTOR FOR FLUID LOADING AND UNLOADING LINES

Susumu Takahashi, Niigata, Japan, assignor to Niigata Engineering Co., Ltd., Japan

Filed Mar. 9, 1983, Ser. No. 473,409
Claims priority, application Japan, Oct. 20, 1982, 57-182700
Int. Cl.[3] F16L 37/08
U.S. Cl. 137—68 R 11 Claims



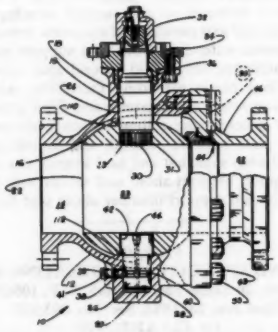
1. An emergency disconnector for disconnecting a pair of couplings in a fluid loading and unloading line, comprising; a pair of seal pistons mounted respectively in said couplings and slidable axially of said couplings under the pressure of a working fluid, said seal pistons being movable to cut off a flow passage for the fluid, said seal pistons including means allowing a fluid, which is a portion of the fluid being transported via said line and which becomes sealed between the seal pistons when cutting off said passage, to escape into lower-pressure fluid, and for sealing the fluid being transported in the couplings, an actuator system for supplying a working fluid to said seal pistons, clamp means actuatable under the operating pressure of said fluid supplied from said actuator system, said operating pressure being higher than that of said seal pistons, and external clamp means for releasing clamps from said couplings to separate the latter from each other in response to the closing off of said couplings and said passage by said seal pistons, respectively, and the actuation of said clamp means.

4,519,412

VALVE AND SEAL THEREFOR

Angal J. Grazioli, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jun. 1, 1983, Ser. No. 500,082
Int. Cl.[3] F16J 15/00; F16K 43/00, 17/40
U.S. Cl. 137—72 13 Claims



12. A sealing assembly for sealing in a ball valve having a body with a valve chamber therein, a ball positioned within said valve chamber and spaced from the interior of said body and a closure, comprising

a metal seat ring having an annular sealing surface for engaging the exterior surface of the ball and a groove in said annular sealing surface,

a resilient seal ring in said groove, and

a two-way seal ring for sealing between the exterior of the ring and the walls of the body surrounding said ring,

said two-way ring including both a dual resilient seal for sealing against pressure from both directions and each of said resilient rings having a metal seal ring, said two-way seal further includes a first resilient seat ring for sealing against upstream pressure, a second resilient seal ring for sealing against downstream pressure, said first and second seal rings being disposed within an annular groove defined a shoulder within said valve body and a shoulder within said metal seat ring, a first metal seal ring embedded in said first resilient seal ring for sealing against upstream pressure when said first resilient seal ring has been destroyed, a second metal seal ring embedded in said second resilient seal ring for sealing against downstream pressure when said second resilient seal ring has been destroyed and said first and second metal seal rings being disposed on opposite sides of said first and second resilient seal rings.

4,519,413

PRESSURE AVERAGER

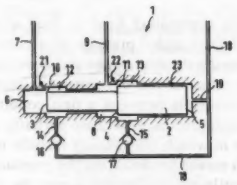
Ludwig Wagenseil, Vohringen, and Hermann Hoffmeister, Nersinger, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Mar. 26, 1984, Ser. No. 593,617

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310791

Int. Cl.³ F15C *3/02*

U.S. Cl. 137—111 **4 Claims**



1. A pressure averager for providing an averaged working pressure from the operating pressure of at least two sources of pressure medium, more particularly hydraulic pumps, there being provided to average the operating pressures a differential piston of which the number of step faces which face in the same direction and which are of equal size corresponds to the number of operating pressures to be averaged, of which the oppositely directed working face is equal to the sum of the step faces, and which can be displaceably guided in a correspondingly stepped housing that is provided with supply lines for the operating pressures, characterized in that annular grooves in each case associated with a control edge of the respective step faces are provided in the housing, and in that leading away from the annular grooves there are discharge lines which are connected to a common line for the averaged pressure which is connected in turn to the working face.

4,519,414

MECHANICALLY BALANCED TAPERED PLUG VALVE

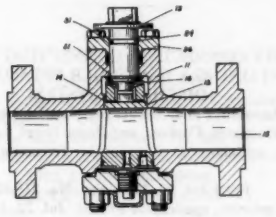
Jose R. Anaya, Coacalco, Mexico, assignor to Industrial de Valvulas, S.A. de C.V., Tepotzotlan, Mexico

Filed Jan. 18, 1983, Ser. No. 458,983

Int. Cl.³ F16K *5/16, 5/22*

U.S. Cl. 137—246.22 **3 Claims**

1. A mechanically balanced tapered plug valve of a type used for fluid flow control, comprising a body with an interior chamber serving as a seat for a rotating tapered plug, which has a rotating fixed support at its lower end and a groove at an upper end for coupling with resilient elements for providing axial balance to the rotating plug and thereby preventing valve lockup produced by pressure and temperature variations of the fluid flowing through the plug valve, said resilient elements transmit axial rotating movement produced by an external driving of a valve stem, said resilient rotatihng movement transmission elements having a seat element having an upper circular face tapered toward the center of the seat element adapted to be received in said groove, a flexible plane washer that fits on the external and upper edge of the seat element



receiving a circular flange of the valve stem, said circular flange having an inverted conical plate with a lower circular surface contacting the flexible plane washer, and wherein the tapering of the plate provides a spring movement space at the immediate upper area of the flexible washer and wherein the sloping of the tapered seat provides a spring movement area immediately below said flexible washer to prevent the tightening caused by the effect of the rotating plug's weight when changing the position of the rotating plug, or by changes in volume caused by temperature variations of the fluid controlled by the balanced plug valve.

4,519,415

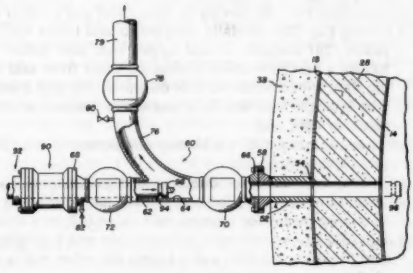
LIQUID STORAGE TANK WITH EMERGENCY PRODUCT REMOVAL APPARATUS

William R. Carn, Naperville, Ill., assignor to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 7, 1982, Ser. No. 375,882

Int. Cl.³ B65D *17/16*

U.S. Cl. 137—318 **2 Claims**



1. A storage tank for a volatile inflammable liquid, liquefied gas or other liquid having properties which make it potentially dangerous comprising:

a primary liquid containment vessel capable of storing the liquid;

a secondary liquid containment vessel having a wall spaced outwardly from and surrounding a substantial portion of the primary vessel, thereby defining an annular space between the two vessels capable of containing liquid

which may escape from the primary vessel if it fails or is damaged;

the secondary vessel wall comprising an inner metal shell surrounded externally by a layer of reinforced concrete;

an attachment fitting having a tubular portion permanently laterally joined to the secondary containment vessel wall;

the fitting tubular portion being embedded in the concrete layer and joined to the inner shell by welding;

means structurally obstructing liquid communication between the annular space and the tubular portion, said means comprising at least continuity of the inner metal shell; and

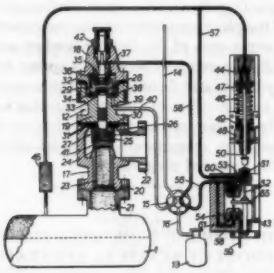
the tubular portion of the fitting being filled with concrete.

4,519,416

SAFETY CONNECTION CONNECTING A VESSEL CONTAINING A GAS UNDER PRESSURE TO A DISCHARGE SYSTEM

Michel Chaouloff, Paris; Michel Bernicot, St. Germain-en-Laye; Pierre Douineau, Coulans, and Roger Boret, Le Vesinet, all of France, assignors to Compagnie Francaise des Petroles, France

Filed Jul. 20, 1983, Ser. No. 515,430
Claims priority, application France, Jul. 22, 1982, 82 12774
Int. Cl.³ F16K *31/12*
U.S. Cl. 137—488 **4 Claims**



1. A safety connection, located between a vessel containing a gas under pressure and a gas discharge system, and comprising:

a discharge pipe in series with a valve (**12**) movable in both an opening and a closing direction, said valve comprising:

an actuating rod (**26**) having an upper end and a lower end,

a closing flap (**24**) pivotally coupled to said lower end,

a piston (**28**) coupled to said upper end, said piston (**28**) having a first face which is directed away from said closing flap, which borders a first chamber (**36**), and a second face opposite said first face and which borders a second chamber (**38**), and

mechanical means (**35**) for biasing said actuating rod (**26**) in said closing direction;

switching means (**15**) for directing said gas under pressure;

an external source (**13**) for compressed gas coupled to said switching means for opening said valve (**12**) as a sluice;

a duct (**37**) having two ends, wherein one end is coupled to said first chamber (**36**) and wherein the other end is coupled to said switching means;

a vent tube (**14**) having two ends, wherein one end is coupled to the atmosphere and wherein the other end is coupled to said switching means;

a pilot valve (**43**) for coupling said duct (**37**) to either said vessel (**1**) during normal operation, or to the atmosphere in case of an overpressure in said vessel (**1**); and

a tubing (**40**) having two ends, wherein one end is connected to said second chamber (**38**) and the other end is connected to said switching means (**15**);

wherein, during a first state, said duct (**37**) is coupled to said pilot valve (**43**) through said switching means (**15**), and said tubing (**40**) is coupled to said vent (**14**) through said switching means (**15**); and wherein, during a second state, said duct (**37**) is coupled to said vent (**14**) through said switching means (**15**), and said tubing (**40**) is coupled to said external source of compressed gas (**13**) through said switching means (**15**),

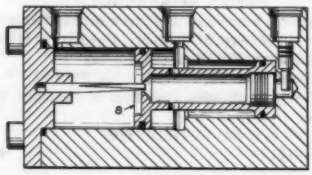
said valve (**12**) operating as a normal valve in said first state, and said valve operating as a sluice in said second state.

4,519,417

DEVICES FOR CONTROLLING FLOW OF FLUID UNDER PRESSURE

Byron A. T. Spencer, Hillsdale, N.J., assignor to Lucas Industries Inc., Troy, Mich.

Filed Jul. 6, 1981, Ser. No. 280,630
Int. Cl.³ F16K *31/124*
U.S. Cl. 137—501 **8 Claims**

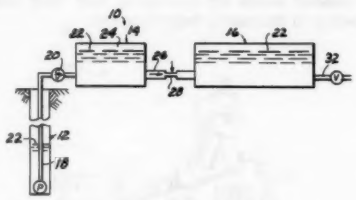


1. A system for controlling flow of fluid along a conduit from a source of fluid under pressure to a consumer device, comprising a primary throttle means and a secondary throttle means for connection in the conduit, said primary throttle means being controllable between a first condition in which the primary throttle means is at least partially closed and a second condition in which the primary throttle means is more fully open, piston means for detecting the pressure drop across the primary throttle means, piston means for detecting the pressure drop across the secondary throttle means, and servo means for controlling the secondary throttle means to establish a feedback relationship between the pressure drop across the secondary throttle means and the time integral of the pressure drop across the primary throttle means, the means for detecting the pressure drop across the primary throttle means and the means for detecting the pressure drop across the secondary throttle means comprise first, second and third lines for connection to the conduit upstream of the primary and secondary throttle means, between the primary throttle means and the secondary throttle means and downstream of the primary and secondary throttle means, respectively, and the servo means comprises a piston and cylinder device which includes a cylinder body defining first and second cylindrical bores, the first bore being of larger cross-sectional area than the second bore, and piston means having first and second piston portions fitted in the first and second bores respectively, thereby defining a first chamber of cross-sectional area equal to that of the first bore, a second chamber of cross-sectional area equal to that of the second bore, and a third chamber defined between an inside portion of the cylinder and an outside portion of the piston, the first chamber being connected to the second line, one of the second and third chambers being connected to the first line, and the other of the second and third chambers being connected to the third line, and means for controlling the secondary throttle means in dependence upon the position of the piston means.

4,519,418
WATER WELL PUMPING SYSTEM

L. B. Fowler, Rte. 1, Box 339, Sasakwa, Okla. 74867

Filed Feb. 17, 1984, Ser. No. 581,004
Int. Cl.[3] E03B *11/00*
U.S. Cl. 137—571 3 Claims



1. In a water well system including a well containing and producing a limited volume of water and having a bottom hole pump submerged therein and connected by tubing with a primary reservoir at the surface of the earth, the improvement comprising:

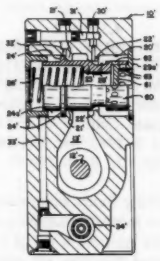
a supply reservoir having a normally closed demand outlet disposed adjacent said primary reservoir; and,

means including a flow restrictor means providing fluid communication between said reservoirs for limiting the volume of fluid flow from said primary reservoir when the demand outlet is open to the fluid producing volume of the well.

4,519,419
HYDRAULIC VALVES

John D. Petro, Hubbard, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Jun. 15, 1982, Ser. No. 388,723
The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.
Int. Cl.[3] F15B *13/04, 13/08*
U.S. Cl. 137—596 12 Claims

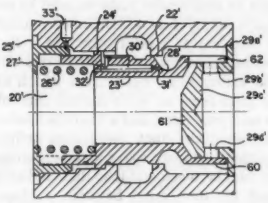


1. A hydraulic valve comprising a valve body having a fluid inlet chamber, a work chamber arranged to deliver fluid to a consumer of hydraulic fluid, an exhaust chamber receiving fluid from the consumer of hydraulic fluid, a longitudinal bore intersecting said chambers, a spool in said bore arranged so that in one position the work chamber is in communication with the inlet chamber and sealed from the exhaust chamber and in a second position the work chamber is in communciation with the exhaust chamber and sealed from the inlet chamber, a transverse bore in the valve housing communicating with said inlet chamber spaced from the longitudinal bore, a hollow valve spool movable in said transverse bore, a resilient biasing means urging said hollow spool to a position closing said inlet chamber from said transverse bore, an amular external radial pressure area intermediate the ends of said hollow spool, first signal passage means communicating from the area between said work chamber and exhaust chamber in said one position and one side of said radial pressure area whereby to supplement the pressure of said resilient biasing means, a second signal passage means communicating between the transverse bore and the opposite side of said radial pressure area acting to oppose said resilient biasing means and supplemental pressure and outlet sleeve means in the end of the transverse bore opposite the resilient biasing means.

4,519,420
HYDRAULIC VALVES

John D. Petro, Hubbard, Ohio, assignor to Commercial Shearing, Inc., Youngstown, Ohio

Filed Sep. 29, 1982, Ser. No. 428,255
The portion of the term of this patent subsequent to May 28, 2002, has been disclaimed.
Int. Cl.[3] F15B *13/04, 13/08*
U.S. Cl. 137—596 9 Claims



1. A hydraulic valve comprising a valve body having a fluid inlet chamber, a fluid transfer chamber on one side of said inlet chamber, a pair of work chambers arranged on opposite sides of said inlet and transfer chambers to deliver fluid to a consumer of hydraulic fluid, a pair of exhaust chambers on opposite sides of said work chambers receiving fluid from the consumer of hydraulic fluid, a longitudinal bore in said valve body intersecting said chambers, a spool in said bore arranged so that in one position one work chamber is in communication with the inlet chamber and sealed from the adjacent exhaust chamber and the other work chamber is in communication with the adjacent exhaust chamber, in a second position the said one work chamber is in communication with the adjacent exhaust chamber and sealed from the inlet chamber and the other work chamber is in communication with the inlet chamber through the transfer chamber and in a third position in which the two work chambers are connected to their adjacent exhaust chambers, a transverse bore in the valve housing communicating with said inlet chamber spaced from the longitudinal bore, a hollow valve spool movable in said transverse bore, a resilient biasing means urging said hollow spool to a position closing said inlet chamber from said transverse bore, an annular external radial pressure area intermediate the ends of said hollow spool, first signal passage means communicating from the area between said at least one work chamber and the adjacent exhaust chamber in a work position of the spool and one side of said radial pressure area whereby to supplement the pressure of said resilient biasing means, a second signal passage means communicating between the transverse bore and the opposite side of said radial pressure area acting to oppose said resilient biasing means and supplemental pressure and outlet sleeve means in the end of the transverse bore opposite the resilient biasing means.

4,519,421
SOLENOID VALVE

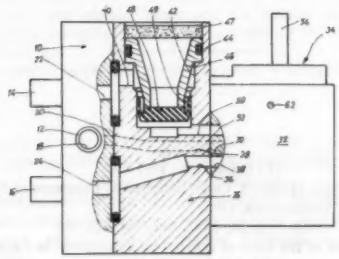
Kurt Stoll, Lenzhalde 72, 7300 Esslingen, Fed. Rep. of Germany

Filed Jun. 28, 1983, Ser. No. 508,961

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1982, 3224937

Int. Cl.³ F16K *11/10*

U.S. Cl. 137—596.16 **10 Claims**



1. A valve mechanism, comprising: a 4-way, 2-position solenoid valve having a supply duct, two working ducts, and an exhaust port; and an attachment plate secured to said solenoid valve and having a supply duct which communicates with said supply duct in said valve, a pilot duct and a through duct which each communicate with a respective one of said working ducts in said valve, an air outlet duct which extends into said attachment plate from an outer surface thereof and communicates with said pilot duct, and a load duct which communicates with said air outlet duct; and means defining a valve seat in said air outlet duct and a valve member which is located in said air outlet duct between said load duct and said pilot duct and is supported for movement between a closed position sealingly engaging said valve seat and an open position spaced from said valve seat; wherein in said closed position of said valve member said pilot duct communicates with said load duct and said valve member obstructs fluid flow from said pilot and load ducts into said air outlet duct; and wherein in said open position said valve member obstructs fluid flow between said pilot duct and said load and air outlet ducts and said air outlet duct communicates with said load duct.

4,519,422
DYNAMICALLY-STOPPED AND STATICALLY-BALANCED VALVE

Kenneth W. Cohen, Westwood, N.J., assignor to Aerco International, Inc., Northvale, N.J.

Filed Sep. 13, 1983, Ser. No. 531,925

Int. Cl.³ F16K *31/128*

U.S. Cl. 137—630.14 **7 Claims**

1. A dynamically-stopped and statically-balanced valve comprising:

a valve structure defining an inlet opening and an outlet opening in fluid communication with each other through an orifice;

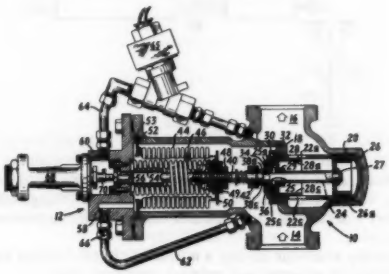
a movable main valve plug for sealing said orifice when in a closed position and allowing full communication between said inlet and outlet openings when in an open position;

a first pilot valve for permitting the flow of fluid from one side of the main valve plug to the other, said valve formed by an opening formed in the main valve plug through which inlet fluid passes to equalize the fluid pressure across the main valve plug and permit the valve plug to be lifted smoothly away from said orifice and a spring-biased valve plug stem attached to the main valve plug and having one end that is movable into and out of engagement with said opening;

a bellows having one end attached to the valve structure and the other end attached to the valve plug stem so as to define an interior bellows space and an exterior bellows space communicating with the inlet opening;

a spring mounted within the valve structure so as to urge said valve plug into sealing engagement with said orifice and the one end of the valve plug stem into engagement with the opening formed in the main plug;

first conduit means for conducting fluid from said inlet opening to the interior bellows space;



second conduit means for conducting fluid from the interior bellows space to the outlet opening; and

a second pilot valve controlling the flow of fluid in said second conduit means on command, wherein the other end of the valve plug stem functions to close off the second conduit when the valve plug is in the open position, whereby pressure in the interior bellows space is maintained at a level whereby the total collapse of the bellows is prevented.

4,519,423
MIXING APPARATUS USING A NONCIRCULAR JET OF SMALL ASPECT RATIO

Chih-Ming Ho, Rancho Palos Verdes, and Ephraim Gutmark, Arcadia, both of Calif., assignors to University of Southern California, Los Angeles, Calif.

Filed Jul. 8, 1983, Ser. No. 512,291

Int. Cl.³ F16K *19/00*

U.S. Cl. 137—888 **23 Claims**

1. Apparatus for mixing fluids, comprising:

first fluid conductive means terminating in at least one noncircular orifice for emitting a jet of a first fluid along a path in a preselected direction, the orifice having unequal major and minor axis dimensions with the major axis dimension being between two and three times the minor axis dimension;

means for providing a second fluid, which is at least partially of the same phase as the first fluid, at a location immediately downstream of the orifice for mixing with the first fluid; and

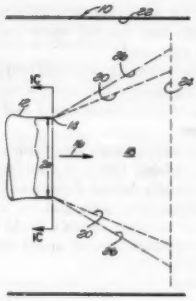
means for defining a mixing region which extends downstream of the orifice a distance at least equal to the minor axis dimension, and which either;

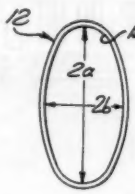
terminates in a wall in the path of the jet; or

continues downstream to a total distance from the orifice of at least three times the minor axis dimension;

the mixing region having a lateral width of at least $2(a+0.4x)$ in a direction parallel to the major axis and a lateral width of at least $2(b+0.4x)$ in a direction parallel to the minor axis, where a and b are one-half the major and

minor axis dimensions, respectively, and x is the distance downstream of the orifice; and





the orifice not diverging from the preselected direction by an angle of more than seven (7) degrees.

4,519,424

HEALD ASSEMBLY OF LOOM

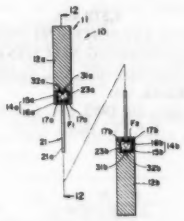
Takao Ishido, Higashikurume; Masasi Nakao, Koganei; Takao Honya, Higashikurume, and Yukio Mizuno, Kodaira, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jul. 23, 1982, Ser. No. 401,212

Claims priority, application Japan, Aug. 19, 1981, 56-128696; Aug. 25, 1981, 56-132080; Aug. 25, 1981, 56-132079; Aug. 25, 1981, 56-132081; Aug. 28, 1981, 56-126470[U]; Sep. 2, 1981, 56-129516[U]; Sep. 2, 1981, 56-129517[U]

Int. Cl.³ D03C *9/06*

U.S. Cl. 139—91 **21 Claims**



1. A heald assembly of a loom comprising:

a heald frame including first and second straight elongated beam members, said first beam member being located over said second beam member, said first and second beam members being respectively formed with first and second inner faces which face to each other;

means defining first and second straight elongated openings in said first and second beam members, respectively, each elongated opening extending along the length of the corresponding beam member, said means forming part of said heald frame first and second beam members;

means defining first and second straight elongated slits on said first and second inner faces, each elongated slit extending along the length of the corresponding beam member, said first and second elongated slits merging in said first and second elongated openings, respectively, each elongated slit being smaller in width than the corresponding elongated opening;

a plurality of healds each including an elongated one-piece heald body, and first and second installation sections secured at the opposite end portions of said heald body to form each heald substantially into a one-piece structure, said first and second installation sections being disposed respectively within said first and second elongated openings so that a part of said heald body is located within each elongated slit, each heald installation section being larger in width than said elongated slit;

means preventing metal-to-metal contact between said heald installation section and said heald frame beam member;

means maintaining surface-to-surface contact between each heald installation section and said means defining first and second straight elongated openings, said surface-to-surface contact maintaining means including at least a flat inner wall surface of each heald frame beam member to define said straight elongated opening, and at least a flat peripheral surface of each heald installation section which peripheral surface is substantially parallel and contactable with said heald frame member inner wall surface; and

means for preventing rotation of said heald around its axis under cooperation of said heald frame beam members and said heald installation sections.

4,519,425

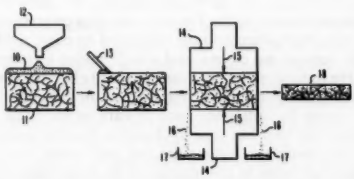
CONTROL METHOD FOR LOADING BATTERY ELECTRODES

Joseph Seidel, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 28, 1983, Ser. No. 508,686

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—1.1 **8 Claims**



1. A method of loading a wet active material paste into a porous, fibrous plaque, comprising the steps of:

(A) applying wet active material paste comprising water and active material solids to a porous, compressible, fibrous plaque, where an excess of paste is applied over the amount that will completely fill the plaque after sizing; and then

(B) forcing the wet paste into the pore volume of the plaque; and then

(C) pressing the pasted plaque to a sized thickness T, where the excess paste is squeezed from the plaque and collected; and then

(D) drying the pasted, sized plaque to evaporate water and provide a loaded plaque; where the specific gravity of the paste is a known value of G grams/cubic centimeter, the fraction of solids in the paste is a known value of S, the unit plaque weight is a known value of W grams/square centimeter, the density of the plaque fibers is a known value of D grams/cubic centimeter, the amount of active material solids loading that is applied to give a required

capacity to the loaded plaque is a known value of M grams/square centimeter of plaque, and the final sized thickness necessary to leave the required active material solids to provide a designated electrode capacity is T centimeters, and where the following relationship exists:

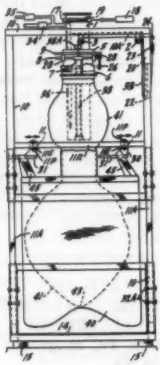
$$T=[M/(GS)]+[W/D].$$

4,519,426

APPARATUS FOR FILLING A LINED, SEMIBULK CONTAINER

Donald P. Hardy, Jr., 152 Parkway Ave., Lake Zurich, Ill. 60047

Filed Dec. 12, 1983, Ser. No. 560,609
Int. Cl.³ B65B *1/04*
U.S. Cl. 141—5 **9 Claims**



1. Apparatus for filling a bulk-bag in which there is an outer bag and inner liner each with an open mouth at the top, which includes a filling chute supported by a main frame and a cone slidably mounted on the chute, said apparatus further including support elements on the frame enabling the outer bag to be suspended thereby so the bag and liner may be positioned with their open tops aligned to the chute and its cone, a clamp that can be opened and closed, said clamp having a complemental fit to the outside of the cone and means to close the clamp after extending the open top of the liner to fit the outside of the cone, means for sliding the cone upward on the chute after the mouth of the liner has been so clamped, thereby to support the liner independently of the outer bag, and means for supplying air under pressure to the interior of the liner after it has been independently supported as aforesaid so that the liner may be inflated sufficiently to remove wrinkles prior to adding bulk material to the independently supported liner.

4,519,427

DEVICE FOR RECOVERING CONTENTS IN CONTAINERS SUCH AS BEER BOTTLES

Motoji Ono; Masao Hirao, and Shigehisa Fukushima, all of Okayama, Japan, assignors to Kirin Beer Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 14, 1983, Ser. No. 504,295
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—65 **7 Claims**

1. A device for recovering the contents in containers such as beer bottles, comprising:

a case supporting means supporting at least one case containing a predetermined number of containers and movable upward and downward;

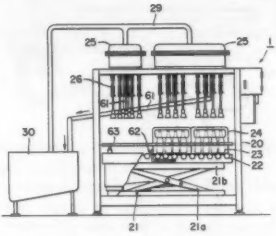
a plurality of recovery pipes provided vertically above said case supporting means, each of said plurality of recovery pipes being in opposed relationship with the opening of each of said containers in said case;

control valve means for controlling the charging of the compressed air into said containers in said case;

an air supply source for supplying the compressed air which is charged through said control valve means into said containers in said case; and

a recovery tank communicating with said plurality of recovery pipes for storing therein the liquid which is forced to be discharged out of said containers in said case through said recovery pipes,

each of said control valve means comprising a first valve member which is slidably fitted on a midportion of each recovery pipe, normally biased downwardly and has an air passage communicating with said air supply source; and a second valve member slidably fitted on the lower end of each recovery pipe, spaced apard downwardly of



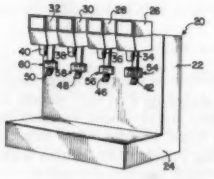
said first valve member by a predetermined distance, having an air passage and adapted to be slidably moved upwardly by the opening of each of said containers when each of said containers is raised upward by the case supporting means with each recovery pipe inserted into each container, said air passage of said first valve member communicating with the air passage of the second valve member so that the compressed air from the air supply source is charged into the corresponding container when the first and second valve members abut against each other on each recovery pipe, each of said recovery pipes being liquid-tightly and slidably extended through the bottom plate of said recovery tank and being normally biased downwardly so that each recovery pipe can slide upwardly by a predetermined distance when the lower end of each recovery pipe strikes against the bottom of each container.

4,519,428

CUP MARKING ATTACHMENT FOR BEVERAGE DISPENSING MACHINES

Albert L. Moody, Lawrenceville, Ga., assignor to F. C. Brown Rentals, Inc., Atlanta, Ga.

Filed Jun. 30, 1982, Ser. No. 393,706
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—98 **16 Claims**



11. A beverage dispensing machine attachment for applying indicia markings to the outer wall of a cup being filled from a

selected nozzle of the machine, to identify the contents of the cup, the attachment including

(a) a marking member comprising a receptacle

(b) an ink impregnated pad positioned in said receptacle

(c) indicia extending outwardly from the outer surface of said ink impregnated pad, the ink from the pad being transferred to the indicia

(d) mounting means for connecting said marking members to said beverage dispensing machine adjacent a nozzle which dispenses a beverage identified by the marking member indicia

(e) said marking member lying in the path of the cup when it is placed beneath the cup for filling, whereby the marking member engages the side wall of the cup to transfer the image of the indicia to the cup wall.

4,519,429

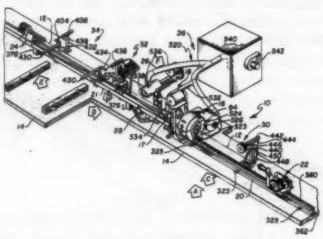
LOG SHAPER

Charles H. Dreese, NW. 124 Chief Looking Glass Rd., Florence, Mont. 59833

Filed Jul. 5, 1983, Ser. No. 510,962

Int. Cl.³ B27C *9/00*

U.S. Cl. 144—3 R **21 Claims**



1. Log shaping apparatus for shaping a wooden log workpiece into a finished log having a uniform diameter and a smooth surface finish, comprising:

a base;

support means attached to the base for supporting the log workpiece at opposite ends thereof;

annular cutter head means rotatably mounted with its axis of rotation substantially aligned with the longitudinal axis of the log workpiece, said annular cutter head means having an inner annular opening therein having a diameter larger than the diameter of said wooden log workpiece;

a plurality of shaper blades fixedly attached radially about the annular opening of said annular cutter head means, the innermost point of the shaper blades determining the diameter of the finished log;

planar blade means fixedly attached about the inner annular opening of said annular cutter head and set at an angle to the workpiece for finishing the peripheral surface of the log;

means for driving said cutter head about its axis; and

means for longitudinally moving said log relative to the cutter head means.

4,519,430

ENERGY SAVING TIRE WITH SILICA-RICH TREAD

Shamim Ahmad, Canal Fulton, and Ronald J. Schaefer, Medina, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jul. 29, 1982, Ser. No. 403,222

Int. Cl.³ B60C *11/00, 9/04, 15/00*

U.S. Cl. 152—209 R **8 Claims**

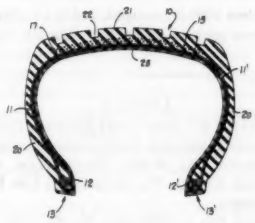
1. In a tubeless pneumatic tire comprising two spaced apart essentially inextensible beads, a ground contacting tread portion comprising a vulcanized rubber including at least two reinforcing fillers and an antioxidant, a pair of sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective said beads, a carcass portion having at least one ply of rubberized cords wrapped around said beads, and a circumferential belt comprising at least two plies of essentially inextensible cords with the cords in each ply parallel to each other, the improvement consisting essentially of the tread being formed of

(i) a fine particle amorphous hydrated silica present in an amount in the range from 18 parts to about 50 parts by weight, based on the total weight of 100 parts of natural or synthetic rubber used in said tread, in combination with from about 0.333 parts to about 2 parts carbon black for each part of said silica, the combined total of said silica and carbon black fillers being in the range from about 50 parts to about 85 parts per 100 parts of said rubber, and,

(ii) a mercapto-substituted silane coupling agent for bonding said silica to said rubber of said tread, said mercapto-substituted silane having the reactivity of the mercapto group reversibly blocked by the presence of at least an equivalent quantity of an organic compound capable of a simple addition reaction to the mercapto compound,

so that the rolling resistance is less than that of an otherwise identical tire having less than 18 parts by weight of said silica present, based on 100 parts of said rubber, and the dry traction of said tire is substantially the same as that of said otherwise identical tire.

5. In a tubeless pneumatic radial tire comprising two spaced apart essentially inextensible beads, a ground contacting tread portion comprising a vulcanized rubber including at least two reinforcing fillers and an antioxidant, a pair of sidewalls extending radially inward from the axial outer edges of said tread portion to join the respective said beads, a carcass portion having at least one ply of rubberized cords lying essentially in radial planes wherein said cords are wrapped around said beads, an integral air impervious inner liner disposed inwardly of said carcass portion, and a circumferential belt comprising at least two plies of essentially inextensible cords with the cords in each ply parallel to each other and at an angle to the circumferential central plane of the tire and with the cords in one ply extending in a direction opposite to the cords in the other ply, the improvement consisting essentially of the tread being formed of



(i) a fine particle amorphous hydrated silica present in an amount in the range from 18 parts to about 50 parts by weight, based on the total weight of 100 parts of natural or synthetic rubber in said tread, in combination with from about 0.333 parts to about 2 parts carbon black for each part of said silica, the combined total of said silica and carbon black fillers being in the range from about 50 parts to about 85 parts per 100 parts of said rubber, and,

(ii) a mercapto-substituted silane coupling agent for bonding said silica to said rubber of said tread, said mercapto-substituted silane having the reactivity of the mercapto group reversibly blocked by the presence of at least an equivalent quantity of an organic compound capable of a simple addition reaction to the mercapto compound,

so that the rolling resistance is less than that of an otherwise identical tire having less than 18 parts by weight of said silica present, based on 100 parts of said rubber, and the dry traction

of said tire is substantially the same as that of said otherwise identical tire.

4,519,431
STYRENE-BUTADIENE COPOLYMERS WITH HIGH STYRENE CONTENT

Yoshito Yoshimura, Yokkaichi; Noboru Oshima, Suzuka; Isamu Shimizu, Kameyama; Shinsuke Yamaguchi, Tokyo; Tatsuo Fujimaki; Tomoharu Yamada, both of Higashimurayama, and Seisuke Tomita, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited and Japan Synthetic Rubber Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 444,027, Nov. 3, 1982, abandoned. This application Jul. 19, 1984, Ser. No. 632,270
Claims priority, application Japan, Nov. 30, 1981, 56-190650
Int. Cl.³ B60C *11/00*
U.S. Cl. 152—209 R **9 Claims**

1. A styrene-butadiene copolymer prepared by the process comprising:

(1) polymerizing styrene and butadiene in a hydrocarbon solvent in the presence of an organolithium compound and

(2) coupling with a tin halide selected from the group consisting of tin tetrachloride, tin tetrabromide, tin methyl trichloride, tin butyl trichloride, tin dimethyl dichloride, tin dibutyl dichloride, tin dichloride and bis(trichlorostannyl)ethane, wherein said copolymer has the following characteristics: (a) at least 30% by weight of the copolymer has at least two tin-carbon bonds in its molecular chain between styrene-butadiene polymer chains; (b) a bound styrene content of more than 25% by weight but not more than 60% by weight; and (c) a vinyl content in the butadiene portion of not less than 30% but less than 50%.

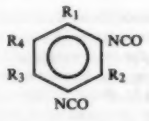
4,519,432
REINFORCED POLYURETHANE TIRES

Andreas R. Schmidt, Reinach, Switzerland; Herbert F. Strohmayer, Allentown, Pa.; Walter Sibral, Tulln, Austria, and Barton Milligan, Coplay, Pa., assignors to Lim International S.A., Luxembourg

Filed Feb. 8, 1984, Ser. No. 577,960
Int. Cl.³ B60C *9/00, 1/00*
U.S. Cl. 152—357 A **16 Claims**

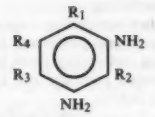
1. In a reinforced urethane tire formed by injecting a polyurea/polyurethane forming composition comprising a prepolymer having an excess of isocyanate groups and an aromatic diamine chain extender, into a tire mold, encapsulating a reinforcing cord in said tire and then curing said composition, the improvement for producing polyurea/polyurethane composition having low hysteresis which comprises reacting:

(a) a prepolymer formed by the reaction of (1) an aromatic polyisocyanate represented by the formula:



where R_1 R_2 R_3 R_4 represents H, alkyl from 1–4 carbon atoms, CN, halogen, CO_2R_5, $CONR_6R_7$ where R_5 represents alkyl of 1–6 carbon atoms and R_6R_7 represents alkyl of 1–6 carbon atoms and H, and mixtures thereof and (2) a polyol of about 500–5000 molecular weight of which at least 90% of the polyol is difunctional in a quantity sufficient to provide from about 2 to 12 weight % isocyanate groups in said prepolymer; with

(b) a chain extender mix comprising (1) an aromatic diamine represented by the formula:

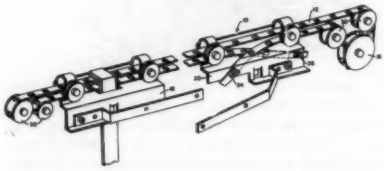


where R_1 R_2 R_3 R_4 represents H, alkyl from 1–4 carbon atoms, CN, halogen, CO_2R_5, $CONR_6R_7$ where R_5 represents alkyl of 1–6 carbon atoms and R_6R_7 represents alkyl of 1–6 carbon atoms and H, and mixtures thereof and (2) a polyol having a molecular weight of from 500–5,000 of which at least 90% of polyol is difunctional, said diamine being present in said chain extender mix to provide a proportion of from 0.5–5 equivalents amine per equivalent polyol.

4,519,433
DRIVE SPROCKET FOR TRAVERSE ROD

Paul E. Comeau, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Continuation of Ser. No. 460,646, Jan. 24, 1983,. This application Sep. 6, 1984, Ser. No. 648,054
Int. Cl.³ A47H *1/08, 5/02*
U.S. Cl. 160—126 **4 Claims**



1. A tape-drive, sprocket, and master carrier combination for traverse rods for curtains comprising:

(a) a pair of hollow telescoping longitudinally adjustable traverse rod sections;

(b) a pair of master carriers mounted to slide within said rod sections;

(c) a length of flexible relatively non-stretchable drive tape for moving said master carriers;

(d) uniformly spaced perforations through said tape forming weakened portions in said tape adjacent to said perforations whereby when said tape is bent in the absence of tension, it bends primarily at said weakened portions;

(e) pulley means at each end of said traverse rod, over which said drive tape passes;

(f) means incrementally adjusting the length of said tape to conform substantially to the length of said rod comprising means for securing the ends of said length of tape to one said master carrier, including a detent at each end of said one master carrier fitting into one said perforation at each end of said tape, to form an endless loop within said traverse rod;

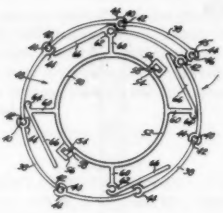
(g) a toothed drive sprocket for driving said tape with the teeth of said sprocket fitting in positive driving relation fully into at least two consecutive perforations in said tape, with said tape bending over said sprocket primarily at said weakened portions, with the tape resting on the surface of said sprocket therebetween, and at least a portion of the curved section of the outer circumference of the sprocket between each of the sprocket teeth being flat in the center of the curved section to conform to the natural bend of the drive tape as said tape passes over the sprocket under light tension, whereby said drive tape conforms to said sprocket and runs noiselessly despite varying degrees of tension on the tape.

4,519,434

WINDING MECHANISM FOR ROLLABLE SHUTTER CURTAIN

William F. Forquer, Venice, Fla., assignor to Security Shutter Corporation, Venice, Fla.

Filed Nov. 19, 1982, Ser. No. 443,047
Int. Cl.³ E06B 9/08
U.S. Cl. 160—133 14 Claims



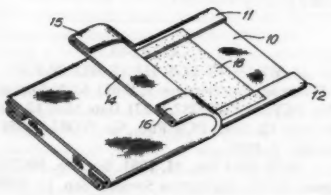
1. A winding mechanism for rolling and unrolling a curtain, said winding mechanism comprising at least a pair of elongated arcuate members slidably interengageable such as to form a tubular drum, at least one arm portion integrally protruding from and longitudinally disposed across the exterior surface of said tubular drum, connecting means for attaching an end of said curtain to an end of one of said arm portions and driving means for rotating said tubular drum and said integrally protruding arm portions about the longitudinal axis of said tubular drum.

4,519,435

SLATS FOR VERTICAL VENETIAN BLINDS

Kenneth Stier, 220-55 46th Ave., Bayside, N.Y. 11361

Filed Aug. 1, 1984, Ser. No. 636,829
Int. Cl.³ E06B 9/36, 9/386
U.S. Cl. 160—166 A 15 Claims



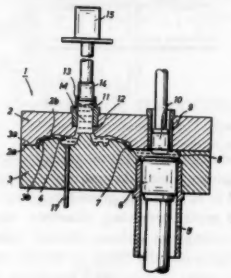
1. In a vertical blind construction comprised by:
an upper generally horizontal track;
slider members positioned within said track and moveable longitudinally thereof;
hanger members attached to said slider members; and,
vertical strip members attached to the respective hanger members;
the improvement comprising:
selected ones of said strip members being comprised of a laminate of a flexible textile fabric sheet material and including;
a backing of a flexible textile sheet material of one width having forwardly and inwardly inturned longitudinal edges;
a facing of a flexible textile material of a width greater than the width of said backing, and having rearwardly and inwardly inturned longitudinal edges; and,
securing means interposed between said backing and said facing and extending at least partially over said inturned edgings of said backing, said securing means terminating within the confines of said inturned edges of said backing.

4,519,436

METHOD FOR INJECTING MOLTEN METAL IN VERTICAL DIECASTING MACHINE

Masuo Ebisawa; Akio Kawase, and Akiyoshi Nakamura, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 226,715, Jan. 21, 1981, abandoned. This application Nov. 10, 1983, Ser. No. 550,907
Claims priority, application Japan, Jan. 21, 1980, 55-5442
Int. Cl.³ B22D 17/12, 17/20, 27/09
U.S. Cl. 164—120 4 Claims



1. A method of injecting a molten metal in a vertical diecasting machine, wherein said diecasting machine includes upper and lower mold elements which define a mold cavity; said upper mold element having at least one opening adapted to communicate said mold cavity with the atmosphere; said opening being closable by a sealing member; and said molten metal being injected into said mold cavity from a cylindrical, vertical pouring basin provided in said mold elements, by a plunger slidably fitted in said pouring basin, said method comprising the steps of:
opening said opening by movement of said sealing member when said mold elements are closed;
injecting said molten metal into said mold cavity by the upward movement of said plunger while said opening is open to the atmosphere;
closing said opening by said sealing member immediately before completion of the injection of said molten metal into said mold cavity; and
thereafter completing the injection of said molten metal with pressure by further upward movement of said plunger.

4,519,437

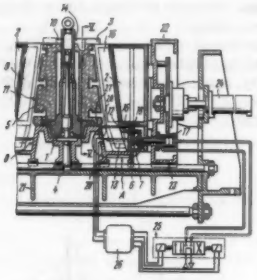
CASTING-BY-SQUEEZING MOLD

Anatoly A. Logvinov, 7-ya Parkovaya, 27, kv. 52; Vladimir N. Milov, Krivorozhskaya, 21, korpus 2, kv. 67; Nikolai S. Ostrenko, Kosinskaya ulitsa, 26, korpus 1, kv. 64; Nikolai A. Demyanovich, 1-y Goncharny pereulok, 7, kv. 108, all of Moscow; Vladimir A. Antonov, Moldavskaya SSR, ulitsa Sredko, 14, kv. 63, Tiraspol; Fen Z. Abdulin, ulitsa Kuznetsova, 6, kv. 35, Ulyanovsk, and Oleg S. Berdiev, ulitsa Sadovaya, 34, kv. 8, Arseniev, Primorsky krai, all of U.S.S.R.

Filed Jul. 23, 1982, Ser. No. 391,123
Int. Cl.³ B22D 17/00
U.S. Cl. 164—284 3 Claims

1. A squeeze-casting mold comprising a base, a pair of mold halves, a core at least one of said mold halves being movable toward and away from said other mold halve between a closed and open position, to form therewith when closed at least one molding chamber and when both open or closed at least one metal receiving chamber communicating with said molding chamber, at least two substantial longitudinal projections on

the walls of at least one of said mold halves, and at least one substantially transverse projection on one of said mold halves which connects the lower ends of said longitudinal projections, said projections dividing said molding chamber into a lower chamber between the base and the transverse projection serving as the metal receiving chamber, and an upper chamber on



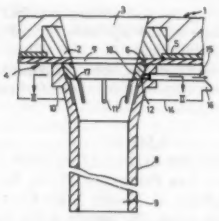
the internal side of the longitudinal projections and surrounding cheeks enclosing the side and upper edges of said mold, a cavity formed in at least one of said mold halves communicating with said metal receiving chamber, said cavity having means for adjusting the volume thereof when said metal receiving chamber is initially filled, to thereby enable adjustment of the level of metal in said metal receiving chamber.

4,519,438

OPENING FOR INJECTING A PROTECTIVE GAS INTO A CASTING TUBE

Roberto Grosso, Kraainem, and Tom P. Hamilton, Tervuren, both of Belgium, assignors to Vesuvius International Corporation, Wilmington, Del.

Filed May 13, 1983, Ser. No. 494,465
Claims priority, application Belgium, May 13, 1982, 208080
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—415 **5 Claims**



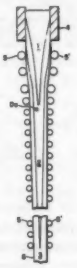
1. A casting tube (8) of a refractory material having an upper end with openings defined therein for the injection of a protective gas during casting into a stream of molten metal flowing through the tube to prevent oxidation of the metal and to cool the walls of the casting tube, the tube having a frustoconical part at said upper end whose outer surface defines a fixing collar (10) for mounting to a base plate (2) of a discharge opening (3) of a casting ladle (1), and in which injection grooves (11) are formed along circumferentially spaced generatrices of the frustum, said injection grooves being interconnected at their upper end by an annular passage (12) communicating through a supporting ring (14) with a source of protective gas.

4,519,439

METHOD OF PREVENTING FORMATION OF SEGREGATIONS DURING CONTINUOUS CASTING

Hasse Fredriksson, Stockholm, and Lars Tiberg, Fatersta, both of Sweden, assignors to Jernjontoret, Stockholm, Sweden

Continuation-in-part of Ser. No. 819,214, Jul. 26, 1977,. This application Feb. 23, 1983, Ser. No. 468,976
The portion of the term of this patent subsequent to Jan. 5, 2002, has been disclaimed.
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—476 **8 Claims**



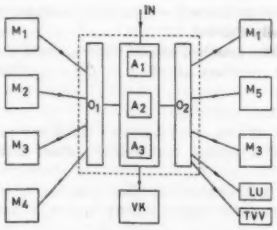
1. A method of preventing the formation of segregations in continuous casting of steel and metal alloys in a strand cast from molten metal, where the cast strand is formed from a molten metal introduced, through a casting chill and undergoing solidification to a solid strand, characterized by physically deforming the cast strand plastically, by action on its external surface, in successive steps from immediately below the chill prior to any other treatment of the strand to a point where the strand is fully solidified, controlling said deforming so that the cross-section area of the strand is reduced to an extent in each of said steps corresponding to the solidification shrinkage and cooling shrinkage of the strand at the position of said step, said deforming steps substantially avoiding upward and downward transport of melt in the strand from the chill to the point where the strand is fully solidified.

4,519,440

METHOD FOR HEAT RECOVERY

Jacob Weitman, Tryffelstigen 8, S-611 63 Nykoping, Sweden

PCT No. PCT/SE81/00257, § 371 Date May 12, 1982, § 102(e) Date May 12, 1982, PCT Pub. No. WO82/01059, PCT Pub. Date Apr. 1, 1982
PCT Filed Sep. 11, 1981, Ser. No. 380,732
Claims priority, application Sweden, Sep. 12, 1980, 8006392
Int. Cl.³ F24H *7/04;* F28D *15/00*
U.S. Cl. 165—1 **6 Claims**



1. A method for the recovery of waste heat with a heat recovery system from a plurality of heat carrying fluids in a heat consuming plant having a plurality of waste heat sources and at least one heat consuming unit, each of said heat carrying

fluids from each of said waste heat sources having a different temperature, comprising the steps of:

classifying said heat carrying fluids according to the temperatures thereof;

supplying said heat carrying fluids having approximately the same temperature to a heat exchanger for transferring the waste heat from said heat carrying fluids to a heat absorbing fluid associated with said heat exchanger;

storing said heat absorbing fluid associated with said heat exchanger in a heat accumulator at a temperature as high as possible and compatible with the thermodynamic characteristics of said heat recovery system; and

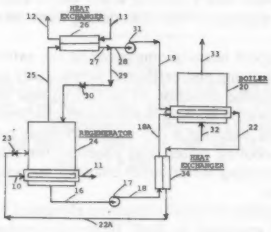
supplying said heat absorbing fluid from said heat accumulator to said heat consuming unit having a temperature requirement compatible with the temperature of said heat absorbing fluid.

4,519,441

HEAT CONVERSION SYSTEM

Jerome S. Spevack, 160 W. Pinebrook Dr., New Rochelle, N.Y. 10804

Filed Sep. 30, 1982, Ser. No. 428,652
Int. Cl.³ F25B *15/00*; F25D *21/00*
U.S. Cl. 165—1 **17 Claims**



1. A process for producing a heat source liquid at a high temperature from thermal energy contained in a flow of hot fluid at a hot temperature lower than said high temperature and for utilizing said heat source, which comprises:

(a) providing a branched circulation of two chemical substances, of which one is non-aqueous and capable of existing in liquid and gaseous states at a low temperature below said hot temperature and the other substance exists in liquid state at said low and high temperatures, and which two substances are capable of undergoing a reversible exothermic reaction of formation of a chemical combination of said two substances in liquid state at either said low temperature and a relatively low superatmospheric pressure corresponding to the vapor pressure of said one substance at said low temperature or said high temperature and a relatively high superatmospheric pressure corresponding to the vapor pressure of said liquid mixture at said high temperature in step (f);

(b) passing said hot fluid in indirect contact heat exchange relation with liquid containing a mixture of said two chemical substances at said low superatmospheric pressure and transferring thermal energy from said hot fluid to the liquid causing said one chemical substance to separate in gaseous state from said liquid while cooling said hot fluid;

(c) passing said one chemical substance separated in gaseous state in step (b) in indirect contact heat exchange relation with a coolant and condensing said separated gaseous substance to liquid state at substantially said low superatmospheric pressure;

(d) pumping liquid condensed in step (c) to said relatively high superatmospheric pressure;

(e) withdrawing liquid remaining after said separation in step (b) and pumping it to said relatively high superatmospheric pressure;

(f) mixing the condensed liquid pumped in step (d) with the liquid pumped in step (e), causing said two chemical substances to undergo said exothermic reaction forming said chemical combination in liquid state and to release thermal energy heating the liquid mixture to said high temperature and producing said heat source therewith;

(b) passing said heat source liquid produced in step (f) in indirect contact heat exchange relation with a heat utilizing fluid and transferring thermal energy to said heat utilizing fluid while cooling said heat source liquid; and

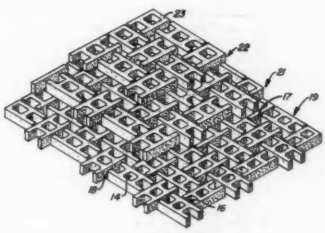
(h) passing said cooled liquid from step (g) through means for reducing the pressure thereof from said relatively high superatmospheric pressure to said relatively low superatmospheric pressure and delivering it to step (b) for recycling therein said liquid containing a mixture of said two chemical substances.

4,519,442

HEAT EXCHANGE STRUCTURE

Gordon L. Barna, Martinez, and James W. Lippert, Livermore, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Aug. 14, 1984, Ser. No. 640,711
Int. Cl.³ F28D *17/04*
U.S. Cl. 165—9.2 **6 Claims**



1. In a heat exchange structure made of individual refractory shapes so as to define interconnected vertical flues extending from top to bottom of the structure, the structure being divided into horizontal levels defined by the vertical height of the individual refractory shapes, the improvement wherein the structure has at least two different type of flues, (1) a first type which has openings to each of the four contiguously adjacent flues at alternate levels and no connection to any other flue at the levels intermediate to the levels with openings and (2) a second type which has openings to two opposed contiguously adjacent flues at alternate levels and openings to the other two opposed contiguous adjacent flues at the intermediate levels.

4,519,443

WINDOW PANE DEFROSTER DEVICE WITH VEHICLE AIR CONDITIONING APPARATUS

Shinji Sutoh, Gunma; Toshizo Hara, and Akiyoshi Takahashi, both of Saitama, all of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 19, 1981, Ser. No. 312,619
Claims priority, application Japan, Oct. 31, 1980, 55-152059
Int. Cl.³ B60S *1/54*
U.S. Cl. 165—17 **14 Claims**

1. In combination in a vehicle air conditioning system including a rear window heater connected to a power source through a rear window heater control switch;

an evaporator at an upstream portion of said system, a compressor and a condenser coupled with said evaporator;

a heater core at a downstream portion of said system;

conduit means bringing air to said evaporator for cooling thereof and to said heater core for heating thereof;

an air mixing door upstream of said heater core for varying the amount of cold and warm air to said heater core;

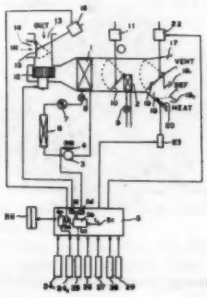
a changeover door and a blower fan in said system for selectively aspirating outdoor or indoor air from ports communicating with the inside or outside of said vehicle and feeding said air to said evaporator in response to the position of said door;

a defrosting device including a control circuit for controlling said compressor, said changeover door and said blower, said control circuit including an allowable operating temperature sensor, comprising:

a comparator discriminator circuit for comparing the outdoor air temperature with a predetermined operating temperature sensed by said allowable operating temperature sensor, and transmitting a first signal when the outdoor air temperature is higher than said operating temperature and transmitting a second signal when the outdoor air temperature is lower than said operating temperature;

a timer circuit;

said control circuit including:



a first sensor circuit for sensing an operating signal for said rear window heater control switch and for sensing the first signal transmitted for said comparative discriminator circuit; and

a second sensor circuit for transmitting a driving signal to said compressor driving means in response to the output from said first sensor circuit so as to operating said compressor and sensing both an operating signal for the rear window heater control switch and a second signal transmitted from said comparator discriminator circuit;

said second sensor circuit controlling the opening of said changeover door in response to the output from said second sensor circuit so as to either increase a feeding rate of outdoor air or increase the feeding volume of outdoor air by means of said blower fan, said timer circuit being operated to sense an operating signal of said rear window heater control switch, to deenergize said power supply for said rear window heater after a specified period of time upon sensing said operating signal; and

said allowable operating temperature sensor being operable to transmit a signal to said control means for said door when said compressor is operated.

4,519,444

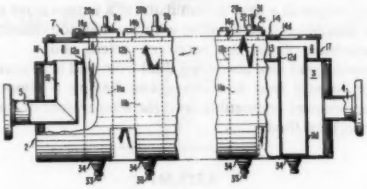
MULTI-UNIT SAMPLE COOLER

Joseph F. Sebald, deceased, late of Bloomfield, N.J. (by Dorothy D. Sebald, executrix), assignor to Heat Power Products Corporation, Bloomfield, N.J.

Filed Jul. 27, 1983, Ser. No. 517,583

Int. Cl.³ F24H *3/00*

U.S. Cl. 165—47 **8 Claims**



1. In a multi-unit sample cooler,

a. an elongated casing defining, a cooling water inlet chamber extending end to end in the lengthwise, longitudinal direction of said elongated casing, a cooling water inlet at one end of said casing connected to a source of cooling water and communicating with the cooling water inlet chamber, and a cooling water outlet remote from and in axial alignment with the cooling water inlet at an opposite end,

b. a support housing connected to the exterior of the elongated casing and extending substantially end to end in the lengthwise direction of said elongated casing, to define therewith a cooling water outlet chamber,

c. means defining a connecting conduit positioned within said cooling water inlet chamber for fluidly connecting said cooling water outlet chamber and said cooling water outlet,

d. a plurality of serially disposed elongated cylindrical partitions mounted in fluid tight relationship extending in spaced relation along the longitudinal direction of said elongated casing transverse to the cooling water inlet and outlet axial alignment and disposed to extend within the cooling water inlet chamber and into the cooling water outlet chamber,

e. a plurality of serially disposed openings arranged in the longitudinal direction of the elongated casing, each respectively receiving a respective one of said cylindrical partitions, and

f. a plurality of sample cooler assemblies each including a sample coil, and each respectively mounted within a respective one of said cylindrical partitions and extending through a respective opening in the support housing in assembled position to form a fluid flow passage with the respective cylindrical partition to permit cooling water to flow about said coil from the cooling water inlet chamber to the cooling water outlet chamber.

4,519,445

TUBE-IN-SHELL HEAT EXCHANGERS

Michael A. Norris, Preston, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Nov. 28, 1983, Ser. No. 555,507

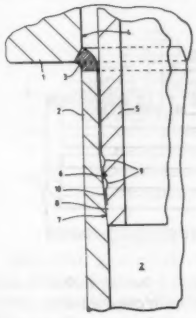
Claims priority, application United Kingdom, Dec. 2, 1982, 8234382; Sep. 8, 1983, 8324106

Int. Cl.³ F28F *9/02*; F16L *41/08*

U.S. Cl. 165—76 **6 Claims**

1. A heat exchanger of the tube-in-shell type with joints between the tubes and each tube plate, having a tubular sleeve within each tube and bridging the joint between each tube and at least one tube plate and sealingly secured to the tube at one end and to the tube plate at its other end respectively, wherein the improvement comprises, each tube being tapered on its inner surface, each sleeve having a matching taper on its outer

surface at or near said one end thereof, each sleeve having at least one land formed on, and at least one groove formed in, its tapered surface, each sleeve being fitted to the respective tube with the tapered surfaces in engagement, and a brazed joint



being made therebetween with the aid of braze material accommodated within the clearance provided between the surfaces defined by the groove or grooves and the tapered inner surface of the tube, whereby the joints between the tubes and the tube plate are individually protected.

4,519,446

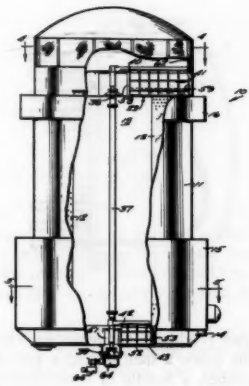
SURFACE CONDENSER/WATER HEATING

Carl L. Elmore; Ted M. Poulin, and Mark D. Barrett, all of Glens Falls, N.Y., assignors to Kamyr, Inc., Glens Falls, N.Y.

Filed Mar. 31, 1983, Ser. No. 480,752

Int. Cl.³ F28F *27/02*

U.S. Cl. 165—101 **11 Claims**



1. A condenser assembly comprising:

a vertical substantially cylindrical vessel having an interior wall;

a plurality of pairs of vertical condenser plates, condensable gases passing between each pair of plates, and said pairs of plates being disposed in a ring around the interior of said vertical cylindrical vessel, and defining an interior passageway substantially circular in cross-section;

an inlet plate disposed above said pairs of vertical condenser plates in said vessel and having an outer annular perforated region coincident with said annular array of condenser plates;

a first condensing liquid inlet and condensing liquid outlet, said inlet disposed at the top of said vessel above said vertical condenser plates, and said outlet disposed at the bottom of the vessel below said vertical condenser plates;

a second condensing liquid inlet and a second condensing liquid outlet, said second inlet being disposed above said inlet plate and said second outlet disposed below said condensing plates, said second inlet being arcuately spaced from said first inlet, and said second outlet being arcuately spaced from said first outlet;

a central shaft extending vertically in the open central area of said vessel;

a top fixed baffle extending radially from adjacent said central shaft to the interior wall of said cylindrical vertical vessel and provided in sealing engagement with said inlet plate and said vessel interior wall to prevent arcuate liquid flow therepast;

a bottom fixed baffle extending radially from adjacent said central shaft and preventing liquid communication between said first and second condensing liquid outlets;

a movable baffle affixed to the top of said central shaft and extending radially therefrom to the interior wall of said vertical vessel, and in sealing engagement with said inlet plate and said vessel interior wall;

a movable bottom baffle operatively attached to said central shaft and preventing arcuate flow of liquid from one side thereof to the other; and

means for rotating said central shaft to change the arcuate positions of said top and bottom movable baffles with respect to said top and bottom fixed baffles.

4,519,447

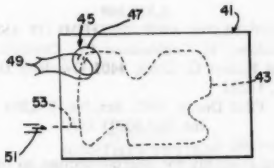
SUBSTRATE COOLING

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corporation, Camarillo, Calif.

Division of Ser. No. 468,665, Feb. 22, 1983, abandoned, which is a continuation-in-part of Ser. No. 174,929, Aug. 4, 1980, Pat. No. 4,374,457. This application Mar. 5, 1984, Ser. No. 584,309

Int. Cl.³ F28D *15/00;* **H01L** *23/46*

U.S. Cl. 165—104.33 **16 Claims**



1. A system for temperature maintenance of a substrate having heat producing components secured thereto or closely adjacent thereto, comprising:

(a) a molded substrate having a heat producing component receiving surface and an enclosed endless channel therein of predetermined configuration closely adjacent said surface;

(b) an electrically conductive liquid within said channel;

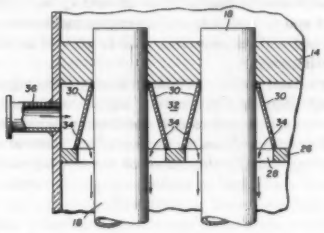
(c) a magnetohydrodynamic generator associated with said channel for moving said liquid around said channel; and

(d) means for removing heat from said liquid.

4,519,448
FALLING FILM HEAT EXCHANGER WITH MEMBER TO DISTRIBUTE LIQUID ON EXTERNAL SURFACES OF TUBES

Vincent F. Allo, Warrenville, and Donald C. Stafford, Hinsdale, both of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed May 16, 1983, Ser. No. 494,937
Int. Cl.³ F28D 3/04
U.S. Cl. 165—118 6 Claims



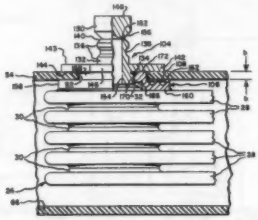
1. A falling film heat exchanger comprising:
a shell connected to vertically spaced apart horizontally arranged circular upper and lower tube sheets;
a plurality of vertically positioned parallel tubes, with each tube extending through and sealingly connected to a hole in each tube sheet;
a circular distribution plate spaced below the upper tube sheet and sealingly connected to the shell defining a heat exchange liquid distribution space, with said parallel tubes extending through oversized holes in the distribution plate;
a heat exchange liquid distribution member surrounding each tube in the distribution space joined at a lower end to the distribution plate around said oversized hole and means preventing liquid from flowing between the member upper end and the tube, said member having means which directs liquid, in the distribution space, against the tube external wall and permits flow of liquid to the tube external wall only from said member;
means to feed a heat exchange liquid to the distribution space and means to withdraw the heat exchange liquid from the shell side of the heat exchanger above the lower tube sheet; and
a feed liquid distribution box positioned above the upper tube sheet and means to deliver a feed liquid to the liquid distribution box.

4,519,449
FLUID COUPLING AND METHOD OF ASSEMBLY

John T. Hoskins, 16 Cobblestone Ct., Orchard Park, N.Y. 14127, and Robert G. Zillig, 4401 Overlook Dr., Williamsville, N.Y. 14221

Filed Dec. 6, 1983, Ser. No. 558,501
Int. Cl.³ F28D 7/10
U.S. Cl. 165—141 32 Claims

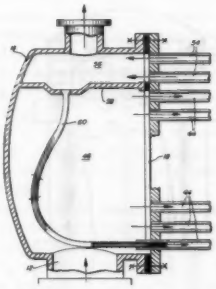
1. A fitting assembly for interconnecting an oil cooler disposed within a header to an oil line which terminates outside of said header, said oil cooler being provided with a port in one surface, and said header heaing provided with a wall having an aperture alignable with said port; said fitting assembly comprising:
a female fitting adapted to be connected to said oil cooler about said port, said female fitting having an aperture extending through its length, at least a portion of said aperture being threaded, and said female fitting further being provided with a neck portion disposable within the aperture of said header wall; and
a male fitting having a main body portion provided with a bore extending its full length, one end of the main body portion being an externally threaded end which is screwed into the threaded aperture of the female fitting, and the other end of the main body portion being provided with means capable of facilitating the interconnection of one end of an oil line to the male fitting in a fluid tight relationship, and the male fitting further including a radially outwardly extending element disposed adjacent the threaded end, a surface of the radially outwardly extending element being capable of bearing against a surface of said header wall.



4,519,450
VACUUM PRODUCING CONDENSER

Walter Kals, Hastings-on-Hudson, N.Y., assignor to Niagara Blower Company, Buffalo, N.Y.

Division of Ser. No. 491,594, May 4, 1983, , which is a continuation-in-part of Ser. No. 324,785, Nov. 25, 1981, abandoned. This application May 18, 1984, Ser. No. 611,966
Int. Cl.³ F28B 9/10
U.S. Cl. 165—114 2 Claims



1. In a vacuum producing condenser for vapors containing non-condensible gases, a shell having a generally horizontal condenser chamber, a bundle of condenser tubes generally horizontally across said condenser chamber, an inlet header at the inlet end of said bundle of condenser tubes, a condensate outlet header at the outlet end of said bundle of condenser tubes, a bundle of gas devaporiation tubes across said condenser chamber and connecting said portion of said condensate outlet header above said bundle of condenser tubes with a portion of said inlet header, and a screen extending completely across the interior of said condensate outlet header through which the mixture of vapor and gas is required to pass before entering said bundle of gas devaporization tubes and through which water is removed from said mixture, said screen including a first screen portion extending generally horizontally from said condenser chamber at a location between said condenser tubes and said gas devaporization tubes and a second screen portion extending diagonally downwardly from a distal end of

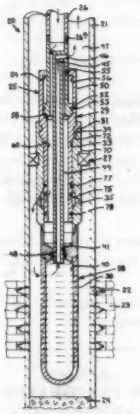
said first portion across the interior of said condensate outlet header.

4,519,451

WELL TREATING EQUIPMENT AND METHODS

Floyd R. Gray, Flower Mound, and Dennis D. Rood, Carrollton, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

Filed May 9, 1983, Ser. No. 493,147
Int. Cl.³ E21B *43/04*
U.S. Cl. 166—278 **35 Claims**



1. A service seal unit tool for setting a packer and screen in place in a well and establishing circuits for circulating fluids therethrough for treating the well therebelow with treating media and removing excess treating media from the well, including:

a. means for connecting the service seal unit tool to a pipe string and to the packer for setting the packer in the well, there being provided lateral port means between the packer and the screen;

b. means sealing between the service seal unit tool and the packer above and below the lateral port means;

c. lost motion means providing limited relative longitudinal movement between the pipe string and the packer while the two remain connected together and while said seal means remain substantially unmoved;

d. means establishing a first circuit for circulating fluids from the surface downward through the packer and the lateral port means to the exterior of the screen, thence through the screen, and upward through the packer to the surface; and

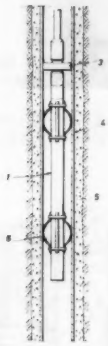
e. means establishing a second circuit in response to longitudinal movement of the pipe string relative to the packer for circulating fluids from the surface downward through the packer and upward therethrough to the surface.

4,519,452

METHOD OF DRILLING AND CEMENTING A WELL USING A DRILLING FLUID CONVERTIBLE IN PLACE INTO A SETTABLE CEMENT SLURRY AND COMPOSITION THEREFOR

Yuh-hwang Tsao, and George G. Binder, Jr., both of Houston, Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed May 31, 1984, Ser. No. 615,851
Int. Cl.³ E21B *33/14, 36/04*
U.S. Cl. 166—288 **12 Claims**



1. A method of drilling and cementing a well using a drilling fluid thermally convertible in place into a settable cement slurry, comprising:

drilling a well with a rotary bit through which an aqueous drilling fluid is circulated, said fluid comprising an aqueous drilling mud containing in intimate admixture therewith cement and a deflocculant which is deactivatable upon exposure to heat;

suspending a casing in said well;

removing said fluid from inside said casing; and

applying sufficient extrinsic heat to said fluid in place within the well annulus to deactivate said deflocculant, thereby converting said fluid in place into a settable cement slurry.

4,519,453

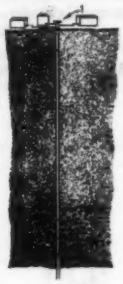
IGNITION SYSTEM

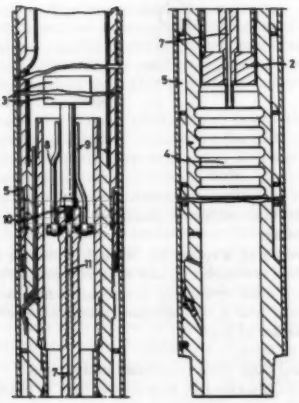
Frederick A. Riddiford, Chertsey, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jul. 28, 1982, Ser. No. 402,540
Claims priority, application United Kingdom, Aug. 1, 1981, 8123620
Int. Cl.³ E21B *36/02*
U.S. Cl. 166—303 **15 Claims**

1. A method of igniting a burner having a combustion chamber and a further chamber comprising the steps of (a) continuously supplying successive separate charges of combustible gas to the combustion chamber of the burner (b) continuously supplying successive separate charges of combustible gas to the further chamber of the burner (c) periodically igniting the

combustible gas in the further chamber by actuation of the ignition source whereby fast moving combustion or detonation





waves pass from the further chamber to the combustion chamber and ignite the combustible fuel in the combustion chamber.

4,519,454

COMBINED THERMAL AND SOLVENT STIMULATION

James M. McMillen, Arlington, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 307,543, Oct. 1, 1981, abandoned. This application Dec. 21, 1983, Ser. No. 564,045

Int. Cl.[3] E21B *43/24*

U.S. Cl. 166—303 **10 Claims**

1. A combined thermal-and-solvent stimulation method for recovering heavy crude oil from an underground reservoir penetrated by a well, which comprises:

(a) heating the reservoir surrounding the well with steam at a temperature below coking temperature but sufficient to increase the temperature 40°–200° F. above the reservoir temperature;

(b) producing the formation substantially immediately after the reservoir is heated, and without a soak period separating step (a) from step (b) until some of the water injected as steam is produced;

(c) injecting a liquid solvent having a ratio of crude viscosity to solvent viscosity of at least about 10 and in an amount ranging from about 5 to about 25 barrels per foot of oil-bearing formation to provide adequate solvent fingering near the wellbore and significantly reduce the viscosity of the heavy crude oil; and

(d) producing a solvent-crude mixutre.

4,519,455

FRACTURING METHOD FOR STIMULATION OF WELLS UTILIZING CARBON DIOXIDE BASED FLUIDS

Marlin D. Holtmyer; Phillip C. Harris, and Charles V. Hunt, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Jan. 20, 1984, Ser. No. 572,732

Int. Cl.[3] E21B *43/26*

U.S. Cl. 166—305 R **13 Claims**

1. A method of fracturing a subterranean formation penetrated by a well bore comprising:

admixing a substantially anhydrous liquid containing ethylene glycol and from about 0 to about 10 percent by weight aqueous fluid with a proppant material, liquid carbon dioxide and a selected surfactant to form a stabilized emulsion, said emulsion comprising from about 30 to in excess of about 95 percent by volume carbon dioxide and said surfactant being present in said emulsion in an amount sufficient to stabilize said emulsion;

introducing said stabilized emulsion into said well bore penetrating said subterranean formation at a temperature below the critical temperature of carbon dioxide and under sufficient pressure to maintain the carbon dioxide as a liquid;

maintaining said stabilized emulsion within said formation for a sufficient time to permit said emulsion to be heated to a temperature above the critical temperature of carbon dioxide to form a stabilized foam from said emulsion, said foam having a viscosity immediately after formation which is substantially the same as the viscosity of the emulsion;

contacting said formation with said foam at a pressure sufficient to create at least one fracture in said subterranean formation; and

depositing said proppant material in said fracture in said subterranean formation.

4,519,456

CONTINUOUS FLOW PERFORATION WASHING TOOL AND METHOD

Chudleigh B. Cochran, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation of Ser. No. 448,881, Dec. 10, 1982, abandoned. This application Aug. 13, 1984, Ser. No. 640,535

Int. Cl.[3] E21B *37/00, 33/124*

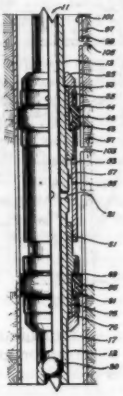
U.S. Cl. 166—312 **8 Claims**

1. In a well bore perforation wash tool of the type having a tubular mandrel with sidewalls defining a flow passage, an upper end for connection in a pipe string and a lower end with means for blocking the flow of fluid from the pipe string through the mandrel, upper and lower pressure responsive, solid, compressible packer assemblies carried on opposite ends of the mandrel, and an outer setting sleeve surrounding the mandrel between the packer assemblies to define an annular chamber between the mandrel and setting sleeve, the improvement comprising:

a continuous flow passage communicating said mandrel interior, said annular chamber and said well bore prior to and after setting said packer assemblies, said continuous flow passage comprising port means in said mandrel sidewalls communicating said mandrel flow passage and said annular chamber and orifice means in said outer setting sleeve for communicating said annular chamber and said well bore; and

wherein said port means and said orifice means are selec-

tively sized to cause a predetermined back pressure buildup in said annular chamber to set said packer assemblies as fluid is continuously flowed through said continuous flow passage.

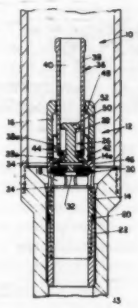


4,519,457

OIL WELL STANDING VALVE

Ronald A. Holland, Newport Beach; Harold L. Petrie, Sierra Madre; John R. Brennan, and Frederick C. Christ, both of Long Beach, all of Calif., assignors to Armco Inc., Middletown, Ohio

Filed Feb. 16, 1984, Ser. No. 580,684
Int. Cl.[3] E21B *34/14*
U.S. Cl. 166—317 **10 Claims**



1. In a standing valve to be retrievably mounted in a well production tubing which will allow the maximum possible fluid flow and also still allow the valve to be easily drained and retrieved through the well production tubing:

(a) a valve body having a passage therethrough and at least one port extending from the passage to the outside body;

(b) sealing means on the outside of said body below said port for sealing engagement with said production tubing in the mounting position of said standing valve;

(c) a seat in said passage of said valve body between said port and said sealing means;

(d) a one-way valve associated with said seat and acting against downward fluid flow, said one-way valve comprising a stem and head, said head having a central aperture therethrough and the lower end of said stem being located in and in sealing engagement with said central aperture and being maintained therein by a break-away device to release when subjected to a predetermined force; and

(e) a puller assembly engagable by a pulling tool and captively mounted in the upper portion of said valve body and engagable with said stem to apply a pulling force thereto and pull said stem upwardly;

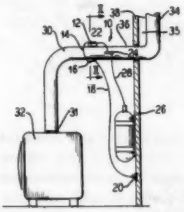
whereby if a pulling force applied to said puller assembly, and thus to said stem, does not retrieve said standing valve, then said break-away device will release and said stem will disengage and expose said central aperture in said head, permitting continued draining of well fluid above said standing valve, and additional force on said puller assembly will remove said standing valve because of the captive mounting of said puller assembly in said valve body.

4,519,458

FLUE FIRE CONTROLLER

David W. Kroeter, Jonesboro, Ark., assignor to Kroeter, Inc., Jonesboro, Ark.

Filed Jun. 23, 1983, Ser. No. 507,093
Int. Cl.[3] A62C *37/02*
U.S. Cl. 169—56 **10 Claims**



1. A flue fire controller for use in conjunction with a thermally conductive flue pipe used for exhausting combustion by-products from a combustion chamber comprising:

a normally open temperature responsive electrical switch mounted on the exterior of said flue pipe in a thermally conductive manner,

a source of fire retardant material under pressure connected by conduit means to a nozzle mounted on the exterior of said flue pipe and having an opening into said flue pipe,

an electrical solenoid operated normally closed valve means energizable through said temperature responsive electrical switch,

said normally closed valve means positioned in said conduit means between said nozzle opening and said source of fire retardant material,

whereby a high temperature in said flue pipe will cause said temperature responsive switch to close, thereby energizing said solenoid, opening said valve means, and discharging said fire retardant material into said flue pipe.

4,519,459

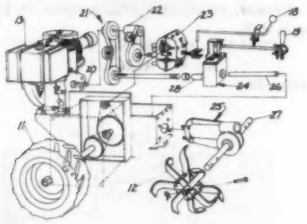
POWER DRIVE REAR TINE TILLER WITH REVERSING GEAR TRANSMISSION FOR THE TINES

Leonard V. Reaume, Natchez Trace Village, Miss., assignor to Magna American Corporation, Raymond, Miss.

Filed Mar. 31, 1983, Ser. No. 480,709
Int. Cl.[3] A01B *33/02*
U.S. Cl. 172—42 **3 Claims**

1. A garden tiller comprising a chassis, a pair of traction wheels supporting said chassis, guide handles attached to said chassis by which an operator may guide said tiller, a tine shaft rotatably mounted in said chassis, earth working tines secured on said tine shaft, said tines being located between the operator and said traction wheels, an engine mounted on said chassis, first transmission means for driving said traction wheels in a given direction via said engine, second transmission means, an

output shaft for said second transmission means, and a differential for driving said tines in said given direction via said second transmission means, said output shaft and said engine, said tiller being characterized by: said second transmission means including a reversing mechanism by means of which said tines may be driven in an opposite, reverse direction of said given direction while said traction wheels continue to be driven in said given direction; said second transmission means comprising a gear train including an output gear operatively connected to said output shaft, a slidable gear movable into rotational driving contact with said output gear to drive said output gear in said given direction, and gear means interposable between said slidable gear and said output gear to drive said output gear in said opposite, reverse direction; said gear train including a splined shaft on which said slidable gear is slidable and with which said slidable gear is rotatable, said splined shaft being



rotatably driven by said engine and constituting a part of said second transmission means, said gear means including a gear idler in meshing engagement with said output gear, and a gear cluster mounted on a common shaft, said gear cluster including a first gear in meshing engagement with said gear idler and free of direct driving contact with said output gear and a second gear spaced therefrom, and shift means to slide said slidable gear out of driving contact with said output gear and into meshing driving contact with said second gear whereby to drive said output gear and output shaft in said opposite, reverse direction via said splined shaft, said slidable gear, said second gear, said first gear and said gear idler; and said rotational driving contact between said slidable gear and said output gear being achieved by a plurality of pins fixed in one of said slidable gear and said output gear and adapted to be received in mating holes fixed in the other of said slidable gear and said output gear.

4,519,460

COMPACTION AND SUPPORT APPARATUS

Jacob N. Gust, West Fargo, N. Dak., assignor to Concord, Inc., Fargo, N. Dak.

Filed Sep. 23, 1982, Ser. No. 421,878
Int. Cl.[3] A01B *49/02*
U.S. Cl. 172—176 **19 Claims**

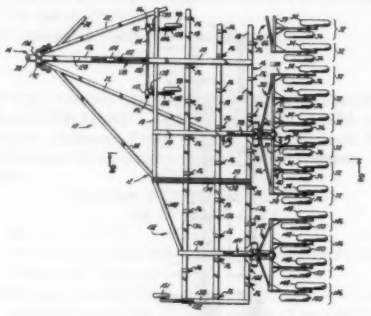
1. A compaction apparatus for packing the ground immediately after tillage, the apparatus comprising:

a frame having a plurality of tillers supported in spaced relation thereby;

a wheel support gang movably mounted on the frame adjacent a rearward end of the frame;

a plurality of compaction and support wheels, one of said wheels being provided per each and every tiller supported on said frame with the wheels being rotatably mounted on the wheel support gang parallel to each other and each wheel being longitudinally disposed behind its respective one of the tillers on the frame with adjacent wheels staggered longitudinally;

vertically movable means for mounting each wheel on the wheel support gang in such a manner that each wheel moves generally independently to substantially follow the contour of the ground while supporting the frame for transport and operation; and



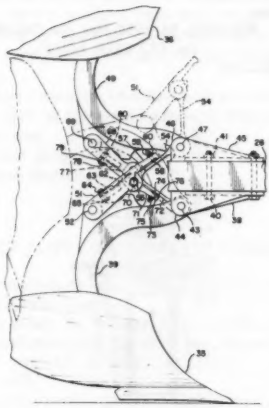
frame height control means for adjusting the height of the frame relative to the wheel support gang and thus controlling the extent of tiller penetration into the ground.

4,519,461

TWO-WAY PLOW WITH OFFSET TRIPS

Eldon A. Harden, Naperville, and Kent B. Randol, Oswego, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Sep. 20, 1982, Ser. No. 420,448
Int. Cl.[3] A01B *3/42, 61/04*
U.S. Cl. 172—225 **4 Claims**



1. A two-way plow adapted to be connected to a mobile power source, said two-way plow comprising:

(a) a frame, said frame being adapted to be connected to the mobile power source for towing, said frame having a longitudinal center line;

(b) a support structure mounted for rotation on said frame, said support structure including a beam having an end located generally adjacent the right side of said frame and extending diagonally rearwardly so that the other end is generally directly rearward of said left side of said frame in one position of rotation;

(c) a plurality of equally spaced right hand plows mounted from said beam by support means for working the soil in one direction in said one position of rotation of said structure, and a plurality of equally spaced left hand plows mounted from said beam by support means upwardly of said right hand plows for working said soil in another

direction upon rotation of said structure to another position;

(d) said support means each including trip linkages with the trip linkage of said right hand plow being offset from the trip linkage for said left hand plow to provide clearance for the tripping action between the plows;

(e) means for rotating said support structure from a rotational axis laterally fixed with respect to said frame at all times, the axis of rotation of said support structure on said frame being offset from the longitudinal center line of said frame, said offset of the axis of rotation being a predetermined amount of the offset between the trip linkages of said right and left hand plows such that, the right hand plow adjacent said frame is located the same distance from the longitudinal center line of said frame when working, as the left hand plow adjacent the frame is located with respect to the longitudinal center line of said frame when working; and

(f) means to prevent tripping action of the non-working plows.

4,519,462

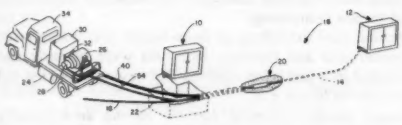
CABLE FOLLOWING APPARATUS HAVING CABLE CLEANING CAPABILITIES AND METHOD

Douglas P. Kelley, Redmond, Wash., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Sep. 2, 1982, Ser. No. 414,485

Int. Cl.³ E21B 7/18

U.S. Cl. 175—53 **13 Claims**



1. An apparatus for cutting through the soil around and along the length of an underground cable for removing the latter, said apparatus comprising: a tubular main body adapted for positioning around said cable, said main body including a front end and a back end; means for causing said main body to move in a forward direction along the length of said cable after said main body has been placed around the latter; means for cutting through the soil surrounding said cable in front of said main body as the latter moves along said cable; and means for directing a plurality of streams of gas toward said cable from points spaced circumferentially around the cable and radially outward therefrom and at sufficient pressure to substantially reduce the entry of particulate material into said circumferential area and possibly lodging between the cable and main body in a way which would prevent the latter from moving along the cable or otherwise damaging the cable and/or apparatus.

4,519,463

DRAINHOLE DRILLING

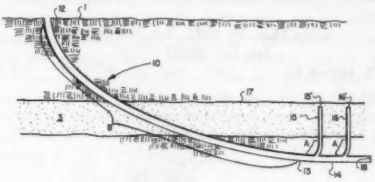
Frank J. Schuh, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 19, 1984, Ser. No. 590,940

Int. Cl.³ E21B 7/06

U.S. Cl. 175—61 **7 Claims**

1. In a method for drilling at least one well in the earth for the production of at least one mineral therefrom, the improvement comprising drilling a primary wellbore into the earth, said primary wellbore being a deviated wellbore having a radius of curvature in the range of from about 2.5 degrees per 100 feet of wellbore length to about 6 degrees per 100 feet of wellbore length, drilling from the deviated portion of said primary wellbore at least one drainhole wellbore, said drainhole wellbore extending into or near the subterranean area from which said mineral is to be produced, said drainhole wellbore having a radius of curvature in the range of from



about 0.2 degrees per 1 foot of wellbore length to about 3 degrees per 1 foot of wellbore length.

4,519,464

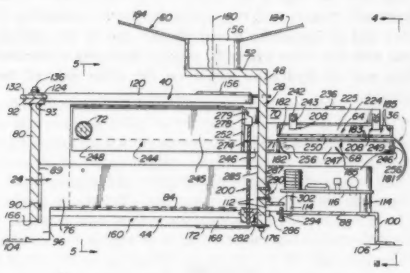
WEIGHING SCALE WITH ADJUSTABLE SUSPENSION AND THERMAL COMPENSATION

James M. Stuart, Malvern, Pa., assignor to Malvern Scale Company, Malvern, Pa.

Filed Sep. 23, 1983, Ser. No. 535,450

Int. Cl.³ G01G 21/12, 21/28

U.S. Cl. 177—244 **31 Claims**



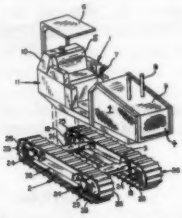
1. A scale comprising frame means including a vertically extending plate having a top edge, platform means arranged to move upon receipt of some material thereon, position sensing means coupled to said platform means to indicate the amount of weight on said platform means and a suspension system for coupling said platform means to said frame means, said suspension system serving to prevent weighing inaccuracies from occurring as a result of an off-centered load being placed on said platform means and comprising a pair of leg members each of which is coupled at one end by first coupling means to said platform means and at an opposite end by second coupling means to said frame means, said second coupling means including a horizontally disposed elongated member which rests upon the top edge of said vertically extending plate and adjustable securement means, said elongated member being flexible in an up/down direction and including an intermediate portion and a pair of upwardly biased free ends, said intermediate portion being fixedly attached to said top edge of said plate and each respective free end being adjustably secured to said plate by said adjustable securement means, whereupon each of said leg members is connected to said elongated member adjacent a respective free end such that the vertical angle of each respective leg is readily adjusted using said adjustable securement means, whereby a respective leg member is lowered by manually positioning the adjustable securement means so as to urge the free end of the elongated member downward and is raised by manually positioning said adjustable securement means so as to permit said upwardly biased free end to move upward.

4,519,465

TRACK TYPE FOUR SPROCKET WHEEL DRIVE CRAWLER TRACTOR

Richard A. Triplett, Star Rte. 2 Box 234, Laytonville, Calif. 95454

Filed Mar. 26, 1982, Ser. No. 362,544
Int. Cl.³ B62D *11/04*
U.S. Cl. 180—6.48 Sheet 1 of 2 4,519,465 6 Claims



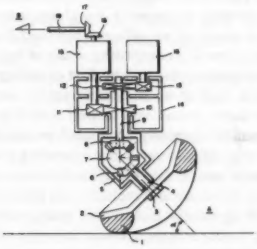
1. A four wheel sprocket drive crawler tractor comprising:
a. A cab;
b. an undercarriage;
c. cross members; and
d. means for propulsion with means for equalizing hydraulic fluid flow through a hydraulic pump and a fore and aft hydraulic motor, with one hydraulic pump connecting to fore and aft hydraulic motor on one side of the tractor, and with one other hydraulic pump connecting to another fore and aft hydraulic motor on the other side of the tractor.

4,519,466

OMNIDIRECTIONAL DRIVE SYSTEM

Yoshiro Shiraishi, Tokyo, Japan, assignor to Eiko Shiraishi, Los Angeles, Calif.

Filed Mar. 30, 1982, Ser. No. 363,615
Int. Cl.³ B62D *57/00*
U.S. Cl. 180—7.1 4 Claims



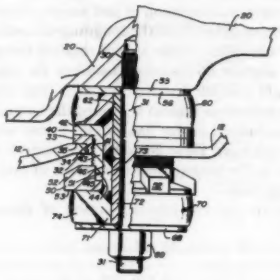
1. An omnidirectional drive system comprising a driven body, a drive unit mounted on said driven body obliquely with respect thereto, and a follower unit mounted on said driven body, said drive unit including a doughnut-shaped wheel which provides a substantially spherical surface, said drive unit having a tilt whose orientation relative to said driven body is changeable by a driving means for changing the direction of movement thereof.

4,519,467

LOWER RADIATOR MOUNT

James W. Saunders, Burlington, Wash., assignor to Paccar Inc., Bellevue, Wash.

Filed Nov. 1, 1982, Ser. No. 438,411
Int. Cl.³ B60K *11/04*
U.S. Cl. 180—68.4 12 Claims



1. An easily adjustable lower radiator mount enabling adjustment from the front of the vehicle without having to remove the vehicle's bumper, for a radiator having a bottom member with a pair of vertical, upwardly extending blind threaded openings extending up thereinto, said bottom member being supported by a frame cross member spaced below said bottom member and provided with a threaded wide opening vertically in line with and of greater diameter than each said blind opening, said mount comprising:

a threaded stud extending up from below said frame cross member into and through each said wide opening and threaded into said blind opening and having a locking nut adjacent its lower end,

a flanged tubular adjusting member having an externally threaded portion threaded into said wide opening, a lower externally keyed portion, and an upper flange extending out radially from its upper end,

a lug nut internally keyed to and surrounding said lower keyed portion, and having a keyed exterior,

upper spacing means bearing against said radiator bottom member, with a rigid upper sleeve around said stud and a resilient portion bonded thereto and having a thick portion lying axially between said flange and said bottom member,

lower spacing means bearing against said locking nut at the lower end of said stud, with a rigid lower sleeve around said stud and a resilient portion bonded to said lower sleeve and having a thick portion lying axially between said lug nut and said locking nut,

whereby said locking nut can be loosened and a wrench applied to said lug nut to turn said adjusting member and thereby to change the spacing between said bottom member and said frame cross member, followed by tightening said locking nut.

4,519,468

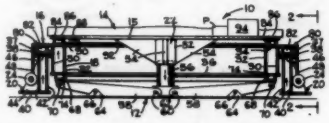
STEERABLE CARROUSEL SUPPORTED WALKING BEAM VEHICLE

Jon L. Mick, Cedar Rapids, Iowa, assignor to FMC Corporation, Chicago, Ill.

Filed Mar. 24, 1983, Ser. No. 478,195
Int. Cl.³ B62D *57/02*
U.S. Cl. 180—8.5 5 Claims

1. A ground supported multi-directional walking beam vehicle comprising: upper and lower frame means; means connecting said frame means together for relative pivotal movement about a vertical axis; means defining walking beams mounted on said lower frame on opposite sides of said axis for horizontal

reciprocal movement; frame lifting means operatively connected to both of said frame means and movable between a first position supported on the ground and lifting the beams from the ground, and a second position lowering said beams onto the ground with the frame being supported by the beams and lifting said lifting means from the ground; means for pivoting one of said frame means relative to the ground when the frame means are supported by said beams, and for pivoting said other frame means relative to the ground when said frame means are supported by said lifting means; and means for moving said beams along parallel paths in one direction when spaced from the ground and in the opposite direction when supported on



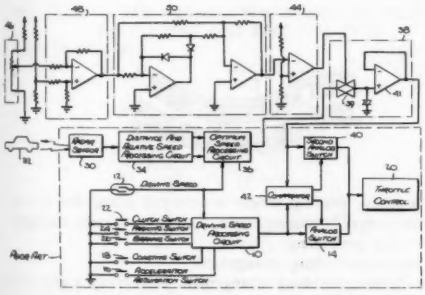
the ground for moving the frames along a linear path; said lifting means comprises a lift cylinder secured to said upper frame and being concentric with said axis, a piston projecting downwardly from said cylinder, a plurality of lift arms with one end of each arm movably connected to said piston and the other end of each arm movably connected to said lower frame, means defining a ground engaging lift pad, and means for movably connecting intermediate portions of said lift arms to said pad means for moving said pad means into vehicle supporting position in response to extension of said piston and for raising said pad means off the ground in response to retraction of said piston.

4,519,469

METHOD AND APPARATUS FOR AUTOMATIC CONTROL OF DRIVING SPEED

Kunihisa Hayashi, and Takahiro Nogami, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 7, 1982, Ser. No. 415,436
Claims priority, application Japan, Sep. 7, 1981, 56-140705
Int. Cl.³ B60T *7/12*
U.S. Cl. 180—169 **4 Claims**



1. In a device for automatically controlling a driving speed of a first motor vehicle, the device including means for setting a desired fixed driving speed signal for the first vehicle, means for detecting a distance to a second vehicle driving ahead of the first vehicle and for generating a corresponding distance signal, means for generating an optimum driving speed signal in response to the distance signal for maintaining an optimum interval between the first and second vehicles, means for comparing the optimum and desired driving speed signals, and means for controlling the driving speed of the first vehicle in response to the lower of said compared signals, the improvement comprising:

means for detecting a deviation from straight course driving of the first vehicle;

means for generating a deviation signal corresponding to a detected deviation from straight course driving; and

a hold circuit connected between the means for generating the optimum driving speed signal and the means for comparing the optimum and desired driving speed signals, said hold circuit being responsive to said deviation signal for holding the value of the optimum driving speed signal delivered to the comparing means constant for the duration of the deviation signal at a value obtained at the beginning of the deviation signal.

4,519,470

SELF-PROPELLED UNIT FOR PROPELLING A PERSON WEARING SNOW SKIS ALONG A RISING SNOW PATH

Giovanni Allisio, Vicolo Lucinicco, 6, Rivoli, Torino, Italy

Filed Mar. 29, 1983, Ser. No. 480,135
Int. Cl.³ A63C *5/08*
U.S. Cl. 180—180 **9 Claims**

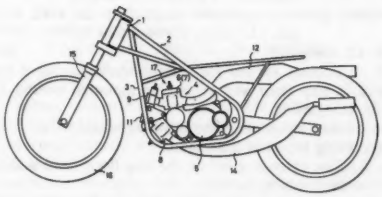
1. A self-propelled unit for propelling a person wearing snow skis along a rising snow path, comprising a frame (7), rolling means (12) for the movement of the self-propelled unit (3) along the snow, an engine (20) for driving the rolling means (12), a transmission (21 to 25) which connects the engine (20) to the rolling means (12), and control means (4) for the engine (20), characterised in that said self-propelled unit is of such dimensions and weight as to be portable, and is provided with rigid means for its releasable connection to the rear ends of the skier's skis (2) to push the skis forward with said unit disposed to the rear of the skis.

4,519,471

MULTI-CYLINDER ENGINE MOUNTED ON MOTORCYCLE

Shinichi Miyakoshi, and Kazuo Oyama, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 425,610
Claims priority, application Japan, Sep. 28, 1981, 56-152029
Int. Cl.³ B62M *7/00;* **F02B** *75/22*
U.S. Cl. 180—219 **6 Claims**



4. In a motorcycle-mounted multicylinder engine, the improvement comprising; said engine having at least three cylinders arranged in a V-configuration, at least one of said cylinders comprising a lower cylinder extending downwardly and forwardly relative to another cylinder, said at least one lower

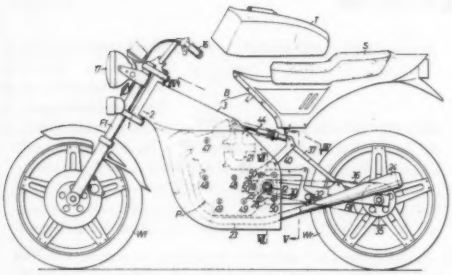
cylinder being provided at a position offset from and between planes defined by sides of a row of said remaining upper cylinders, and a plurality of carburetors in equal numbers to said cylinders and positioned in front thereof, each of said carburetors being provided with an air intake port directed generally frontwardly of said motorcycle.

4,519,472

MOTORCYCLE

Tadashi Kamiya, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 152,102, May 21, 1980, Pat. No. 4,356,877.
This application Aug. 13, 1982, Ser. No. 407,804
Claims priority, application Japan, May 26, 1979, 54-65236
The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.
Int. Cl.³ B62K *25/20*
U.S. Cl. 180—227 **3 Claims**



1. A two wheeled motorcycle, comprising
a frame member, and
a power unit mounted on said frame member for driving a rear wheel,
a rear fork pivotally mounted on said power unit and supporting said rear wheel in driving connection therewith,
a compression link having a basal end and a distal end and pivotally mounted at its basal end on said rear fork in staddling relation to said rear wheel,
a rocker link having opposite ends and pivotally mounted at one end thereof on said power unit and pivotally connected with the distal end of said compression link, and
a rear shock absorber connected at one end thereof to said power unit and at the other end thereof to the other end of said rocker link.

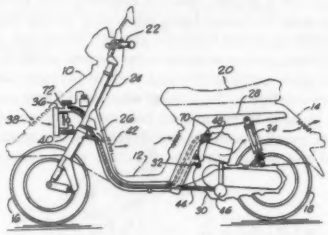
4,519,473

COOLING SYSTEM FOR A MOTORCYCLE

Hideo Ochiai, Tokyo; Masumi Haman., and Masahiko Kimoto, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 9, 1983, Ser. No. 530,982
Claims priority, application Japan, Sep. 20, 1982, 57-163387
Int. Cl.³ B60K *11/04*; B62K *11/00*
U.S. Cl. 180—229 **10 Claims**

7. A cooling system for a motorcycle having a front leg shield, a step floor and an engine mounted behind the step floor, comprising
a radiator mounted at the front leg shield;
a cooling jacket at the engine;
a feedline extending below the step floor from said radiator to said cooling jacket;
a return line extending below the step floor from said cooling jacket to said radiator;
a thermostat selectively restricting flow through said return line;
a bypass line extending from said cooling jacket to forwardly of the step floor and being in communication with said radiator, said bypass line being substantially smaller than said return line; and



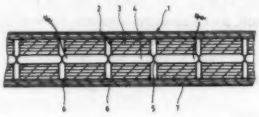
a pump inducing flow to said cooling jacket from said feedline.

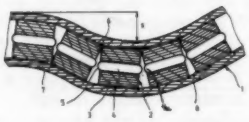
4,519,474

SAFETY BEADING

Jakob Iseli, Windisch, and Hans-Hermann Pribnow, Nussbaumen, both of Switzerland, assignors to Invento AG, Hergiswil, Switzerland

Filed Sep. 6, 1983, Ser. No. 529,492
Claims priority, application Switzerland, Sep. 13, 1982, 5417/82
Int. Cl.³ B60R *18/04*
U.S. Cl. 180—279 **10 Claims**



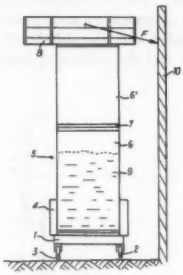


1. A safety beading which is arranged along the shock-absorbing edges or closing edges of an automatically movable contrivance comprising:
an electric switching arrangement;
said electric switching arrangement comprising a plurality of contact elements;
each of said contact elements possessing a contact point;
an elastic tube which is prestressed along its length;
said contact elements being disposed in series in said elastic tube, so that the contact elements are pressed together at said contact points thereof when in a normal inoperative position by the action of the pre-stressing of the tube; and
said contact elements comprise insulated edges which touch during the transition to an operative position under the action of an external force, whereby the contact elements perform a rocking movement against one another and contact is interrupted.

4,519,475
SCAFFOLDING

Karl Bollinger, Rueil Malmaison, France, assignor to Soletanche, Nanterre, France

Filed Dec. 28, 1982, Ser. No. 453,824
Claims priority, application France, Dec. 24, 1982, 82 21742
Int. Cl.³ E04G 1/15, 1/24
U.S. Cl. 182—17 7 Claims

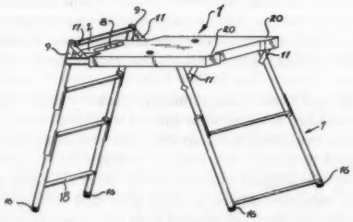


1. Scaffolding that is intended for operations carried out at a certain height and capable of resisting horizontal forces comprising a tower formed from at least one vertically immovable liquid-tight element of substantially constant cross-sectional area that can contain liquid ballast sufficient for resisting horizontal forces carried out at said certain height, means for supporting the tower on the ground, and an operations deck at a fixed height at the top of the tower at said certain height and supported directly by said at least one vertically immovable liquid-tight element for performing operations that result in said horizontal forces.

4,519,476
DETACHABLE WORKBENCH TOP

Salvador Alimbau Marques, Barcelona, Spain, and Giorgio Grasselli, Albinea, Italy, assignors to Andral Corporation, Williamsville, N.Y.

Continuation-in-part of Ser. No. 492,487, May 6, 1983, Pat. No. 4,448,283, which is a continuation-in-part of Ser. No. 537,276, Sep. 29, 1983,. This application May 29, 1984, Ser. No. 614,625
Int. Cl.³ E04G 1/30; E06C 7/16, 1/383
U.S. Cl. 182—28 19 Claims

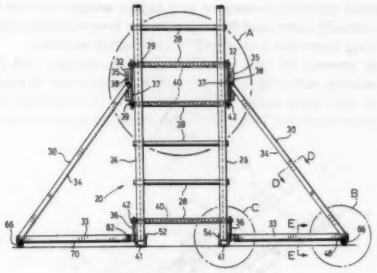


1. A detachable top adapted for use with a supporting structure comprising a substantially rectangular main portion having an extending section protruding therefrom, said extending section having a width less than that of said main rectangular portion and adjacent to and integral with one side of said main portion, a side wall extending downward from substantially the entire peripheral portion of said main rectangular portion and said extending section, and a cutout area located between said main portion and said extending section.

4,519,477
LADDER STABILIZING APPARATUS

Robert Ralston, 294 Silverstone Dr., Townhouse 71, Rexdale, Ontario, Canada (M9V 3J4)

Filed Nov. 15, 1983, Ser. No. 551,802
Claims priority, application Canada, Nov. 15, 1982, 415580
Int. Cl.³ E06C 5/36, 7/44, 1/08
U.S. Cl. 182—107 15 Claims



1. Stabilising apparatus for use with a ladder having hollow rungs and comprising:

at least one stabilising device having first and second bracket means for securing the stabilising device at respective upper and lower positions along a side of the ladder;

each bracket means coupled to one end of at least one elongate rod which can be passed through a hollow rung and its other end secured to the other side of the ladder;

a first elongate member having one end adapted to be removably coupled to the upper bracket means, and its other end for acting as a foot of the stabilising device for effectively increasing the base width of the ladder;

a second elongate member shorter than the first elongate member having one end pivotably connected to the lower bracket means, and its other end pivotably connected to the first elongate member; the pivotal connections permitting pivotal movement in the plane of the ladder;

the stabiliser being movable between an in-use position and a stored position; whereby in the in-use position the first elongate member is displaced at an angle from the side of the ladder by said second elongate member which acts as a supporting strut, to locate the other end of the first elongate member at a distance from the foot of the ladder and effectively increase the base width of the ladder, and in the stored position said first and second elongate members can be folded along the side of the ladder and retained therein by retaining means.

4,519,478
LADDER EXTENSION COUPLING

James H. Hulme, Milton, and Stuart E. Shinn, Scarborough, both of Canada, assignors to Supreme Aluminum Industries Limited, Scarborough, Canada

Filed May 17, 1984, Ser. No. 611,206
Int. Cl.³ E06C 1/10, 1/28
U.S. Cl. 182—178 30 Claims

1. A ladder comprising two separable sections, a ladder extension section and a base ladder section to be coupled together in longitudinally overlapping relation to constitute an extension ladder;

each section comprising rails and rungs, portions of each rail of the extension section at the lower end thereof being spaced to be received between rails of the ladder section and having complementary primary slots formed therethrough to slidably receive one rung of said ladder section therein;

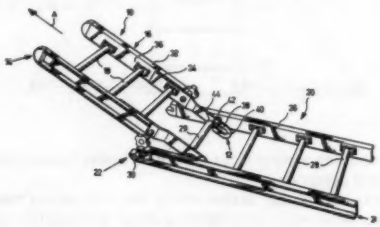
each primary slot having a blind end proximate the lower

end of the extension section, said primary slots extending from said blind end longitudinally away from the lower end of the extension section to an open end permitting entrance of said one rung therein; wherein with said one rung received in said primary slots at said blind ends, said extension section being rotatable with respect to said ladder section about said one rung;

first coupling means on said extension section spaced longitudinally from said slot on the remote side of the slot from the lower end of the extension section;

second coupling means on said ladder section spaced longitudinally from said one rung on the remote side of said one rung from the lower end of the ladder section;

stop means, on one of said extension section and ladder section, wherein with said one rung received in said slots at said blind ends, on rotation of said extension section about said one rung, said stop means stopping rotation of



said extension section about said one rung at a position wherein said first and second coupling means are in alignment for coupling,

said first and second coupling means engaging to couple together by sliding the extension section from said position in a substantially longitudinal direction with respect to the ladder section to slide said one rung in the primary slots away from said blind ends, said primary slots being of sufficient longitudinal extension that with said first and second coupling means coupled together said one rung being retained within said primary slot;

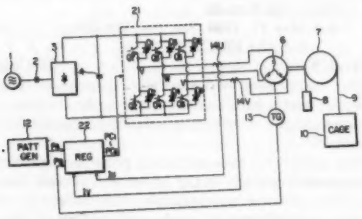
the first and second coupling means on coupling preventing further sliding of said extension section in said direction, and with said first and second coupling means coupled together and said one rung retained within said primary slots relative rotation of said extension section with respect to said ladder section is prevented.

4,519,479

SAFETY APPARATUS FOR ELEVATOR

Toru Tanahashi, Gifu, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 12, 1984, Ser. No. 619,911
Claims priority, application Japan, Jun. 15, 1983, 58-107188
Int. Cl.[3] B66B *5/06*
U.S. Cl. 187—29 R **8 Claims**



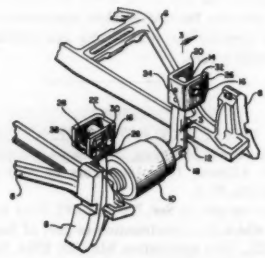
1. In an elevator having a converter which changes an A.C. output from an A.C. power source into a D.C. output, an inverter which changes the D.C. output of the converter into an A.C. output, a current detector which detects an output current of the inverter, and an inverter controller which controls the inverter on the basis of the detected current value of the current detector and a command current value, a hoist motor being driven by the A.C. output of the inverter; a safety apparatus for an elevator characterized by comprising decision means to decide whether or not a difference between the detect current value of said current detector and the command current value exceeds a preset value, and operation inhibition means to inhibit the operation of said inveter when said decision means has decided that the difference between the detected current value and the command current value exceeds the set value.

4,519,480

BRAKE LEVER RETAINING BRACKET

Thomas A. Nelson, Munster, Ind., assignor to Hadady Corporation, Lansing, Ill.

Filed Apr. 1, 1983, Ser. No. 481,295
Int. Cl.[3] B61H *13/38*
U.S. Cl. 188—52 **2 Claims**



1. In a railroad tread brake rigging for a self aligning spring railway freight car truck, having side frames supported at their ends upon wheel and axle assemblies and a bolster resiliently supported at its ends for vertical movement upon spring groups seated on the side frames, and having brake power cylinders affixed to the lowermost end of brake levers connected to the bolster from brackets, the improvement comprising:

a lightweight brake lever retaining bracket comprising:

a base member adapted to be affixed to a bolster,

two arms extending horizontally from said base, said arms adapted to receive the head of a brake lever, said arms having openings to receive a brake lever retaining pin,

stiffener members affixed to each arm, said stiffener members having openings aligned with the openings coaxially in said arms and adapted to receive a brake lever retaining pin;

a safety bolt means connecting the extremities of said arms, and limiting the distance between the extremities of said arms, and safety platforms affixed to to the lowermost portion of said arms and extending inwardly, and limiting the lateral movement of said brake lever, said inwardly extending safety platforms adapted to engage the head of said brake lever in the event said retaining pin is removed or withdrawn.

4,519,481

SUSPENSION STRUT FOR VEHICLES

Lawrence G. Nicholls, Birmingham, England, assignor to Lucas Industries Limited, Birmingham, England

Continuation of Ser. No. 267,535, May 29, 1981, abandoned.
This application Jul. 27, 1983, Ser. No. 517,562
Claims priority, application United Kingdom, Jun. 3, 1980, 8018066; Oct. 22, 1980, 8034082; Apr. 14, 1981, 8111747
Int. Cl.³ F16F 9/36
U.S. Cl. 188—322.17 4 Claims

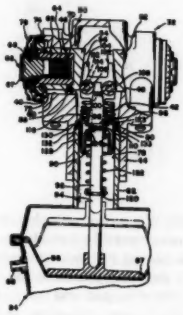
1. A suspension strut for a vehicle comprising a cylinder having an inner wall and an outer wall, a piston adapted to work in said cylinder in sliding engagement with said inner wall, a piston-rod carrying said piston, a closure for one end of said cylinder and through which said piston-rod passes into said cylinder, a volume of gas or air and a volume of hydraulic fluid retained within said cylinder, restrictor means in said piston to permit a limited flow of fluid past said piston in both directions in response to relative movement between said cylinder and said piston, and said volume of gas or air is adapted to support at least a part of the load on the vehicle and to accommodate hydraulic fluid displaced within said cylinder by volume of the entering piston-rod, wherein said closure through which said piston-rod extends comprises a plug of annular outline received in said cylinder at said one end, and a cylindrical extension separate from said plug, said plug having a cylindrical outer face co-operating with said inner wall of said cylinder, a cylindrical inner face openly spaced from said piston rod, and a planar radial end face interconnecting said cylindrical inner and outer faces at the inner ends thereof, means for retaining said plug in said cylinder at said one end, and said cylindrical extension depends axially into said cylinder, is spaced radially from said cylinder for the whole of the axial length of said extension between inner and outer ends thereof, and has an inner and an outer wall, and an annular space defined between said inner wall of said cylinder and said outer wall of said extension accommodates the whole of said volume of gas or air and a portion of said volume of hydraulic fluid, and wherein said outer end of said extension is adjacent to and axially located inwardly of said planar radial end face of said plug, and said extension is provided adjacent to said plug with an outwardly directed radial flange, a first seal through which said piston-rod works being carried by said extension at a position which is always below the level of said hydraulic fluid in said cylinder, irrespective of the position of said piston within said cylinder, and an annular second seal being disposed at the end of said annular space which is adjacent to said plug and being located adjacent to said plug, in engagement with said radial flange, said annular second seal being trapped between said inner wall of said cylinder and said outer wall of said extension and having sealing engagement with said inner wall of the cylinder and said outer wall of the extension, said second seal providing the sole sealing means between said extension and said cylinder.

4,519,482

WEDGE ACTUATED DRUM BRAKE ASSEMBLY

William E. Ott, and Edwin A. Krieg, both of Elyria, Ohio, assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 5, 1982, Ser. No. 345,970
Int. Cl.³ F16D 51/62
U.S. Cl. 188—343 7 Claims



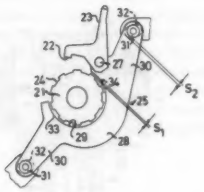
1. Drum brake assembly comprising a drum mounted for rotation with a member to be braked, a fixed support non-rotatably mounted adjacent said drum, a pair of friction elements slidably mounted on said fixed support presenting opposite pairs of contiguous ends, and an actuator assembly between at least one of said pairs of contiguous ends of said friction elements for urging the latter into braking engagement with said drum when a brake application is effected, said actuator assembly including a housing mounted on said fixed support, a pair of pistons slidable in said housing, each of said pistons being operably connected to a corresponding one of said friction elements for urging the latter toward said drum, a force transmitting assembly movable relative to said housing and including a force transmitting member and a camming member slidable on said force transmitting member, said force transmitting assembly being movable between brake applied and brake released conditions for forcing said pistons toward a position urging said friction elements against said drum when a brake application is effected, said camming member moving with clearance between said pistons during initial movement of said force transmitting assembly, and resilient means yieldably urging said force transmitting assembly toward the brake released condition, characterized in that said resilient means includes compression spring means carried between said force transmitting member and said camming member for urging the latter toward stop means defined on said force transmitting member and for maintaining the camming member in engagement with the stop means during said initial movement of the force transmitting member, said compression spring means being movable with said force transmitting assembly, and extension spring means between the force transmitting assembly and the wall of said housing for extending or elongating from its relaxed condition as the brake is applied so that the camming member and therefore the force transmitting means are returned to the brake released position as said extension spring returns from its extended condition to its relaxed condition, the forces generated on said camming member by extension of said extension spring being counterbalanced by the forces exerted on said camming member by said compression spring during said initial movement of the force transmitting member, the force of said compression spring overcoming the force of said extension spring when said clearance between said pistons and the camming assembly has been taken up.

4,519,483

PARKING BRAKE IN A VEHICLE TRANSMISSION

Heinrich A. Schlicker, Bengtsfors, Sweden, assignor to AB Volvo, Gothenburg, Sweden

Filed Nov. 18, 1982, Ser. No. 442,795
Claims priority, application Sweden, Nov. 24, 1981, 8106982
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **7 Claims**



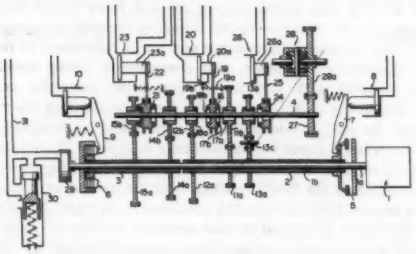
1. Parking brake in a motor vehicle transmission comprising a catch element non-rotatably joined to a rotatable shaft in the transmission and having at least one radially directed cavity, and a catch body movably joined to the transmission housing, said body being movable into and out of engagement with the cavity in the catch element and, when in the engaged position, locking the shaft against rotation in the housing, characterized in that the catch body is movably mounted in a yoke which partially encircles the shaft in the region of the catch element, said yoke having abutment surfaces on diametrically opposite sides of the shaft, and in that the yoke is mounted in the housing at a distance from said abutment surfaces, with play, to permit displacement of the yoke in a plane perpendicular to the shaft, the play between the yoke and the housing being greater than the difference between the distance between the abutment surfaces and the diameter of the circle circumscribing the catch element, so that one or the other of the abutment surfaces of the yoke can be displaced into contact with the catch element when said catch body is in engagement with said cavity, depending on the direction in which the catch element imposes force on the catch body.

4,519,484

MULTIPLE CLUTCH TRANSMISSION HAVING GEAR CONTROL DEVICE

Mitsuru Nagaoka; Kazuya Oda, and Shizuo Sumida, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 18, 1983, Ser. No. 467,846
Claims priority, application Japan, Feb. 22, 1982, 57-27127
Int. Cl.³ B60K *41/22*; F16H *5/42, 5/60*
U.S. Cl. 192—3.58 **9 Claims**



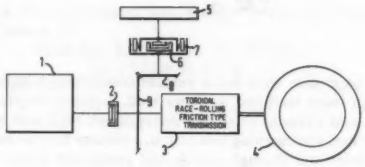
1. A multiple clutch type transmission including a plurality of input shafts, a plurality of clutch devices for releasably and alternately connecting respective ones of said input shafts with an engine output shaft, each of said input shafts being associated with at least one set of transmission gears for disengageably connecting the input shaft associated therewith to an output element of the transmission, means for controlling said clutch devices so that selected one of said input shafts is connected through selected one of said clutch devices with the engine output shaft, gear engaging means for engaging selected set of said transmission gears so that selected one of said input shaft is connected with the output elements, control means for producing a clutch engaging signal upon receipt of a gear engaging command to thereby engage disengaged one of said clutch devices to establish a substantially synchronizing condition in a selected set of said transmission gears, then a clutch disengaging signal for disengaging the clutch device and thereafter a gear engaging signal to operate said gear engaging means for the selected set of the transmission gears to engage the same gear set.

4,519,485

DRIVELINE FOR REGENERATIVE BRAKING

Christopher J. Greenwood, Preston, England, assignor to Leyland Vehicle Limited, England

Filed Mar. 18, 1982, Ser. No. 359,505
Int. Cl.³ B60K *41/02*
U.S. Cl. 192—0.033 **13 Claims**



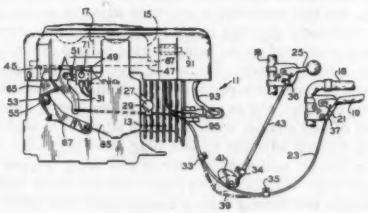
1. A vehicle driveline comprising a continuously-variable-ratio transmission having an input, an engine for driving said transmission, a flywheel, a first power-transmitting means connected between said engine and said transmission input, and a second power-transmitting means connected between said transmission input and said flywheel, said first power-transmitting means including first coupling means operable to drive said transmission by said engine and inoperable to drive said engine by said transmission, said second power-transmitting means including second coupling means operable to selectively drive said flywheel by said engine or said transmission and third coupling means operable to drive said transmission by said flywheel only while said first coupling means is inoperative to drive said transmission by said engine.

4,519,486

ENGINE FLYWHEEL BRAKE TOGGLE MECHANISM

William O. Hermanson, Kiel, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Sep. 13, 1982, Ser. No. 417,411
Int. Cl.³ B60K *41/20*
U.S. Cl. 192—3 S **15 Claims**



1. A safety device for an internal combustion engine pow-

ered implement including an engine ignition system, engine starting mechanism and having a deadman control normally biased toward a first position and actuable by an implement operator to a second position comprising:

a flywheel coupled to the engine crankshaft for rotation therewith;

a braking member having a friction surface normally biased into engagement with an annular surface of the flywheel;

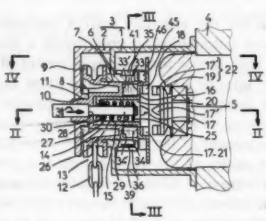
means biasingly coupling the braking member to the deadman control for retracting the friction surface out of engagement with the flywheel annular surface upon movement of the deadman control to the second position and including a pivotable linkage having first and second lever arms pivotably fastened to the engine and a third lever arm pivotably joining the first and second arms to cause the first and second arms to pivot in unison about their respective engine pivot points to move the braking member relative to the flywheel annular surface with substantially constant biasing force on said deadman control.

4,519,487

ALTERNATE MANUAL OR POWER AUXILIARY CONTROL DEVICE FOR CONTROLLING WINDING DOORS OR THE LIKE

Guy Florin, Cluses, France, assignor to Somfy, Cluses, France

Filed Dec. 2, 1982, Ser. No. 446,264
Claims priority, application France, Dec. 30, 1981, 81 24527
Int. Cl.³ E06B *9/204*; F16D *11/10*
U.S. Cl. 192—36 **2 Claims**



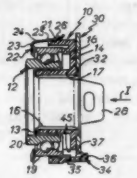
1. An auxiliary control device for winding doors or grilles, sectional doors, or the like, which comprises a rotary control member adapted to be actuated manually and rotatably for producing the axial translation of a sliding member coaxial to the control member against the force of a resilient means through the medium of a frontal cam device disposed transversely between said control member and said sliding member, said sliding member supporting a first half-coupling adapted, beyond a predetermined sliding movement, to engage a corresponding second half-coupling supported by a main drive shaft controlling the winding door or grille, sectional door or the like, a device being provided for producing an antagonistic torque counteracting the rotation of said sliding member, wherein said device capable of producing an antagonistic torque consists of a rotary braking member disposed coaxially to said sliding member and responsive to a friction element, said rotary braking member comprising at least one guiding projection extending towards said second half-coupling and adapted to be contacted and slidably engaged by a corresponding nose, extending in the direction opposed to the direction of said guiding projection, provided on said sliding member, so as to cause said sliding member to slide towards said second half-coupling, the heights of said guiding projection and nose respectively being such that the axial movement of said sliding member is shorter than the axial movement resulting from the action of said cam device.

4,519,488

CLUTCH RELEASE BEARING

Pierre Renaud, Le Plessis-Trevise, France, assignor to Valeo, Paris, France

Filed Feb. 25, 1983, Ser. No. 469,706
Claims priority, application France, Mar. 23, 1982, 82 04883
Int. Cl.³ F16D *23/14*
U.S. Cl. 192—98 **18 Claims**



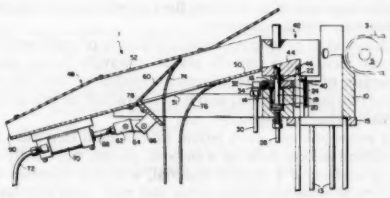
1. A clutch release bearing comprising a control member, an operating member, a transversely disposed flange on said operating member adapted to be acted on by said control member, a drive member adapted to cooperate with a release mechanism of a clutch, means axially linking said drive member to said operating member, a wear-resistant plate disposed on a surface of said flange facing away from said drive member, at least one elastically deformable snap-fastener lug linking said wear-resistant plate axially to said flange, said lug having a root section in one piece with said operating member, a retaining shoulder facing towards said flange and adapted to retain said wear-resistant plate, and the distance between said root portion and said shoulder being greater than the corresponding thickness of said wear-resistant plate, and indexing means for locating said wear-resistant plate relative to said operating member, said indexing means being separate from said lug and projecting from the same side of said flange as said lug and extending axially beyond at least that portion of said lug which first bears against said wear-resistant plate during its engagement therewith.

4,519,489

CAN END SAMPLER

Jack D. Dingus, Russell County, and Edward C. Gilliam, Washington County, both of Va., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 508,083, Jun. 27, 1983, abandoned.
This application Oct. 22, 1984, Ser. No. 662,805
Int. Cl.³ B65G *11/20*
U.S. Cl. 193—31 R **6 Claims**



1. Apparatus for controlling can end flow from a generally horizontal input path comprising a first deflector, means for vertically reciprocating said first deflector between an upward and a downward position, said first deflector having a generally horizontal surface over which said can ends pass without being affected in their movement by said first deflector when said deflector is in its downward position and said first deflector having a generally vertical deflecting surface against which said can ends impinge to stop their horizontal movement and to

guide said can ends in a vertical direction by gravity when said first deflector is in its upward position, said generally horizontal surface and said generally vertical surface each maintaining their respective attitudes between said upward and said downward position, a first chute for capturing said can ends which impinge against said generally vertical deflecting surface of said first defelctor, a conveying surface for said can ends which pass over said first deflector, a second deflector having a deflecting surface against which said can ends conveyed by said conveying surface impringe to stop their horizontal movement when said second deflector is in an open position and a surface over which said can ends pass without being affected in their movement by said second deflector when said second deflector is in a closed position, means for controlling said second deflector between said open and said closed positions and a second chute for capturing said can ends which are impinged against the deflecting surface of said second deflector.

4,519,490
METHOD AND APPARATUS FOR ENTRAPMENT PREVENTION AND LATERAL GUIDANCE IN PASSENGER CONVEYOR SYSTEMS

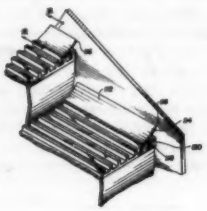
Carl J. White, 1869 Strum Ave., Walla Walla, Wash. 99372

Continuation of Ser. No. 268,022, May 28, 1981, Pat. No. 4,413,719. This application Jun. 24, 1983, Ser. No. 507,601

The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.

Int. Cl.³ B66B *9/12*

U.S. Cl. 198—333 **3 Claims**



1. In an escalator for continuously conveying passengers along a path of travel extending between two landings at respective opposite ends of the escalator, which includes drive means, two spaced-apart skirt panels which extend between the two landings along said path, and an endless series of steps which are continuously moved in sequence between the two skirt panels along said path by the drive means, wherein each step includes an outer tread surface which extends rearwardly from a front edge of the step between opposite lateral sides of the step and an outer riser surface which extends downwardly from the step front edge between the opposite step lateral sides, an apparatus which comprises:

each said skirt panel comprising a plurality of panel sections, each including a smooth, planar, inwardly-facing, lateral surface of a first material which together extends between the two landings along said path and which lie in a vertical plane when in alignment; and

said series of steps, each lateral side of each step including bearing means defining a smooth, planar, outwardly-facing surface of a second material, which is disposed in a vertical plane extending along said path, each step lateral planar surface having top and front edges which comprise the entire exposed portions of the step lateral edges on one lateral side of the step;

wherein the lateral planar surfaces of each step moving along said path are disposed in close proximity to the respective adjacent skirt panel lateral planar surfaces, to create sliding contact between the full lateral planar surfaces defined by the bearing means of each step and respective adjacent skirt panel lateral planar surfaces aligned in said vertical plane, and a relatively zero running clearance gap between the full lateral planar surfaces defined by the bearing means of each step and respective adjacent skirt panel lateral planar surfaces not aligned in said vertical plane, and thus reduce the possibility of any object being inserted or drawn between one of the lateral sides by any step and the adjacent skirt panel.

4,519,491
APPARATUS FOR THE ASSEMBLY AND/OR MACHINING OF CIRCULATING AND IMMOBILIZABLE PARTS CARRIED BY PALLETS

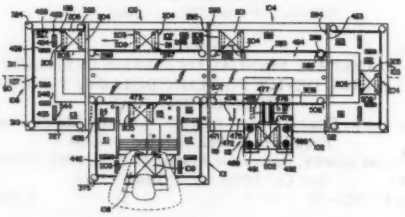
Maurice Prodel, 153, rue de Verdun, and Jacques Prodel, Rue de Cuts, both of Carlepont 60170 Ribecourt, France

Filed Oct. 14, 1981, Ser. No. 311,117

Claims priority, application France, Oct. 14, 1980, 80 21976; Apr. 8, 1981, 81 07088; Sep. 11, 1981, 81 17272; Oct. 9, 1981, 81 19109

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—349 **12 Claims**



1. Apparatus for the assembly and/or machining of parts, manually and/or automatically, comprising a multiplicity of work stations with means for the displacement of pallet part-carriers to the interior of a station and from one station to another by at least one carriage in continuous movement wherein the driving of a pallet by a carriage is done along one edge, the arrangement of the at least one carriage being such that the motor cables of the carriage are at a predetermined level for the driving of a pallet in one direction and at a different level for the driving of a pallet in a perpendicular direction, each station comprising a module mounted in a removable manner on a fixed frame, each module having a generally rectangular configuration, a pulley being provided at each corner of the configuration for the guiding of a said carriage, and the bores of each pulley being at different levels.

4,519,492
METHOD AND APPARATUS FOR TRANSPORTING PACKS FROM A FEED TRACK TO A DISCHARGE-CONVEYOR TRACK

Heinz Focke, Verden, Fed. Rep. of Germany, assignor to Focke & Co., Verden, Fed. Rep. of Germany

Continuation of Ser. No. 370,423, Apr. 21, 1982, abandoned. This application Sep. 20, 1984, Ser. No. 652,434

Claims priority, application Fed. Rep. of Germany, May 6, 1981, 3117859

Int. Cl.³ B65G *47/24*

U.S. Cl. 198—408 **9 Claims**

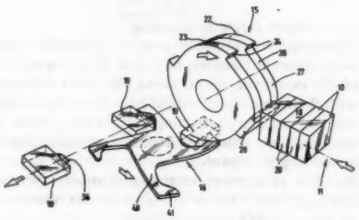
1. A transport apparatus for cuboid packs (10) such as cigarette packs having relatively wide front and rear faces and relatively narrow tops, bottoms and sides, particularly adapted for use in conjunction with a packaging machine, comprising:

(a) an elongate feed conveyor (11) for serially supplying incoming packs in an upright position with their wide faces abutting at an outlet end thereof,

(b) a first intermediate conveyor (15) comprising a first continuously driven rotary wheel disposed adjoining the outlet end of the feed conveyor for individually with-

drawing packs therefrom and for rotating such packs through 90° about an axis parallel to an axis of said wheel such that a narrow side of each pack is foremost in the direction of movement,

(c) a second intermediate conveyor (**16**) comprising a second rotary wheel continuously driven at the same speed as the first wheel and disposed adjoining the first wheel downstream from the outlet end of the feed conveyor for individually tangentially withdrawing packs carried by the first wheel and for rotating such packs through 90° about an axis parallel to an axis of said second wheel, the respective rotational axes of the first and second wheels being offset 90°, peripheral pack engaging zones of the second wheel having a greater radius than corresponding zones of the first wheel to thereby increase the spacing between successive packs, and a maximum radius of the first wheel being less than the shortest distance from the center thereof to a nearest face of the second wheel such that said wheels do not intersect or mesh with each other,



(d) a discharge conveyor (**17**) disposed adjoining an outlet zone of the second wheel for individually withdrawing packs carried thereby,

(e) the outer periphery of the first wheel defining a plurality of equally circumferentially spaced depressions (**25**) for individually receiving a pack for conveyance, and

(f) each depression being defined by a circular contour (**26**) of substantially constant radius smoothly merging, in a direction opposite the rotational direction of the wheel, into a spiral contour (**27**) of increasing radius, in turn smoothly merging into a straight portion (**28**) terminating at an outwardly extending abutment (**24**) disposed perpendicular to said straight portion, each depression thus presenting a gradually increasing depth to packs being supplied by the feed conveyor to thereby implement a mechanically "soft" transfer of the packs and minimize any stress impacts.

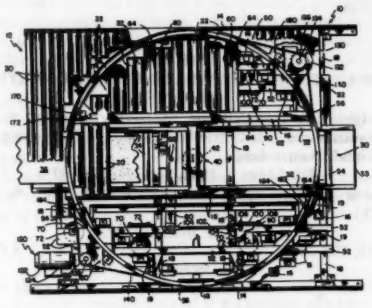
4,519,493

TURNTABLE FOR ROLLER CONVEYOR SYSTEM

Thomas A. Dyer, Greenwood, Ind., assignor to Pentek Corporation, Indianapolis, Ind.

Filed Feb. 28, 1983, Ser. No. 470,205
Int. Cl.³ B65G *29/00, 47/24*
U.S. Cl. 198—414 **16 Claims**

12. A turntable for a conveyor system comprising a main frame, the main frame including side frame members, a plurality of load-carrying rollers supported by the side frame members for rotation about transverse axes, means for propelling the load-carrying rollers to transport a load between ends of the conveyor system, a lift frame supported by the main frame, a load-supporting table carried on the lift frame, means for accumulating the load on the load-carrying rollers, means for moving the lift frame between a first position where the load-supporting table is slightly below the load-carrying rollers and a second position where the load-supporting table is above the load-carrying rollers, means providing lift guide slots, lift-leveling bars engaging the guide slots, means for coupling the lift-leveling bars to one of the lift frame and main frame, means for linking the guide bars to each other to produce level movement of the lift frame, glide means for allowing rotation of the load-supporting table relative to the lift frame to change the position of the load on the load-carrying rollers, two-speed drive means for rotating the load-supporting table at first and second speeds, means for stopping the rotation of the load-supporting table at a predetermined position, and sensing means for reducing the speed of the drive means prior to stopping the rotation of the load supporting table at the predetermined position.

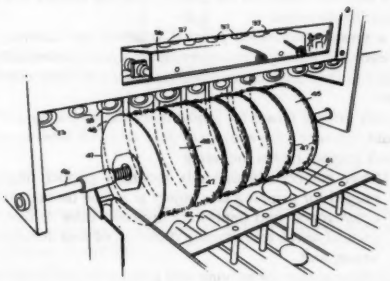


4,519,494

EGG HANDLING SYSTEM

John C. McEvoy, and Leslie P. Thomas, both of Canton, Mich., assignors to Diamond Automations, Inc., Framington, Mich.

Filed Jul. 1, 1982, Ser. No. 394,161
Int. Cl.³ B65G *47/19*
U.S. Cl. 198—448 **34 Claims**



1. An apparatus for transferring eggs continuously conveyed in spaced-apart, aligned relationship by a conveyor means to a receiving station in an egg grading apparatus at which the eggs are collected and packaged according to their physical characteristics, comprising,

conveyor means including carrier members coupled thereto for conveying adjacently spaced rows of eggs in a spaced-apart aligned relationship,

rotatable, resilient receiving means disposed at said receiving station below said conveyor means and having the peripheral edge thereof disposed at the approximate centerline of the adjacently spaced rows of eggs, said receiving means being adapted for rotational movement downwardly and away from said conveyor means for receiving eggs delivered by said conveyor means to said receiving station, said receiving means comprising rotatable, resilient cylinder means having a plurality of spaced-apart disk means forming a plurality of channels in said cylinder means for receiving said eggs, said carrier members being selectively actuated to release the eggs so that the eggs from both said adjacently spaced rows of eggs carried by

said conveyor means fall onto and are received by respective ones of the channels of said cylinder means, and

support means, disposed below said rotatable, resilient receiving means, for guiding eggs delivered to said receiving means downwardly and away from said receiving means.

4,519,495

APPARATUS FOR SEPARATING AND CONVEYING OBJECTS

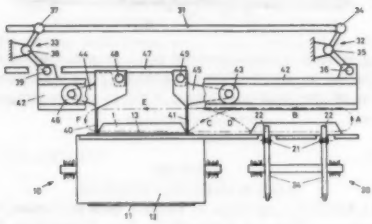
Hans-Ulrich Bolli, Schleitheim, Switzerland, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed May 5, 1982, Ser. No. 375,100

Claims priority, application Switzerland, May 6, 1981, 2945/81

Int. Cl.³ B65G *25/00*

U.S. Cl. 198—486 **4 Claims**



1. An apparatus for separating and conveying substantially rectangular, plate-like objects comprising:

(a) a delivery conveyor for transporting the objects in a transporting direction;

(b) a removal conveyor situated adjacent said delivery conveyor and having a transporting direction substantially parallel to the transporting direction of said delivery conveyor; and

(c) fork gripper means for sequentially sliding the objects from said delivery conveyor onto said removal conveyor, said fork gripper means including

(1) two rotationally movably mounted gripper fingers arranged for gripping one object at a time on said delivery conveyor at two oppositely disposed sides of the object parallel to the transporting direction of said delivery conveyor, and

(2) drive means for moving said gripper fingers towards one another to grip an object at a height level on the delivery conveyor, for translating said gripper fingers with the object, at said height level, from said delivery conveyor to said removal conveyor at an obtuse angle with the transporting direction so that during the transfer of the object from said delivery conveyor to said removal conveyor the object is displaced by a given distance in the transporting direction, for moving said gripper fingers away from one another to release the object on the removal conveyor, and for lifting said gripper fingers on a return path over the objects on the removal conveyor and on the delivery conveyor, said drive means including guide rail means articulated to said gripper fingers; push rod means for moving said gripper fingers as a unit transversely between said delivery conveyor and said removal conveyor at said obtuse angle; said gripper fingers being articulated to said push rod means; and actuating rod means operatively connected to said guide rail means to displace said guide rail means in a direction having a component perpendicular to the direction of movement of said push rod means to pivot said gripper fingers on said push rod means towards or away from one another.

4,519,496

CONVEYOR SCREW WITH WEAR-RESISTANT MEMBERS ATTACHED TO ITS OPERATIVE SURFACE

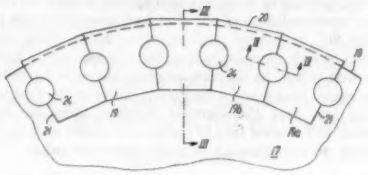
Erik Ludvigsen, Soborg, Denmark, assignor to Alfa-Laval Separation A/S, Soborg, Denmark

Filed Nov. 24, 1982, Ser. No. 444,177

Claims priority, application Denmark, Dec. 9, 1981, 5456/81

Int. Cl.³ B65G *33/26*

U.S. Cl. 198—676 **7 Claims**



1. A conveyor screw comprising:

a substantially continuous row of generally quadrilateral wear-resistant elements mounted on the operative surface of the conveyor screw along the outer contour thereof with their outer longitudinal edge faces following broadly said contour and protruding beyond the contour, and with their end faces extending generally in radial directions and in abutting relationship;

a plurality of element retaining members secured to the conveyor screw for retaining said wear-resistant elements on the operative screw surface;

each element retaining member having thereon an axially symmetric guide surface, the diameter of which decreases towards the operative surface of the screw, the symmetry axis of each guide surface intersecting said screw surface in a point of the radial dividing line between two juxtaposed wear-resistant elements;

each wear-resistant element having in each of its end faces a recess defining a guide surface which is complementary to one half of the guide surface on an element retaining member;

the recesses on said end faces of said juxtaposed wear-resistant elements forming a combined recess having a size exceeding that of the element retaining member received in said combined recess thereby providing a narrow gap between said element retaining member and said wear-resistant elements; and

said gap being filled with a resilient padding agent forming a bond between said element retaining member and said wear-resistant elements.

4,519,497

CONTAINER, IN PARTICULAR FOR A CODICIL OR SIMILAR PERSONAL DOCUMENT

Edith L. C. Brinkers, Leidsegracht 2, Amsterdam, Netherlands

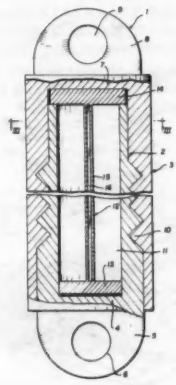
Filed Dec. 22, 1983, Ser. No. 564,389

Int. Cl.³ A45C *11/00*; B65D *83/00*

U.S. Cl. 206—37 **1 Claim**

1. A container for a personal document, which the relevant individual should carry substantially at all times, said container comprising a first, substantially cylindrical inner sleeve, open at one end and closed at one end, provided over at least part of its length with an external screw thread and a second substantially cylindrical outer sleeve open at one end and closed at one end, provided over at least part of its length with an internal screw thread and which can be screwed thereon from the open end of the inner sleeve such that a closed space can be formed within the two sleeves into which the personal document can be positioned, while at least one of the sleeves is provided with means to which a chain, string or the like may be attached, and further including a reel on which the personal document can be wrapped, the reel being sized to be shoved into the inner

sleeve with a part thereof always protruding from the inner sleeve, and wherein the end of the reel extending from the inner sleeve includes a disk which is formed from a flexible material, said disk having a diameter greater than the inner



diameter of said inner sleeve and less than the inner diameter of said outer sleeve, said disk resting on the open end of said inner sleeve and being clamped between the open end of the inner sleeve and the closed off end of the outer sleeve when said outer sleeve is screwed onto said inner sleeve.

4,519,498

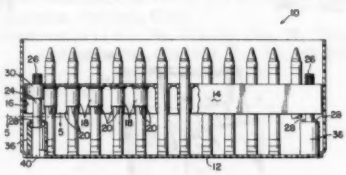
SECURING MECHANISM FOR CONTAINER COMPONENTS AND THE LIKE

Darcy L. Booth, 11750 E. Ranchito St., El Monte, Calif. 91732

Filed Mar. 13, 1984, Ser. No. 588,938

Int. Cl.³ B65D *85/28, 25/10*

U.S. Cl. 206—214 **21 Claims**



12. A container and organizer for crayons and the like, comprising:

a box having a bottom wall and normally upwardly extending side walls,

a removable tray configurated and sized to fit within said side walls and defining a plurality of orifices sized to receive said crayons,

a securing mechanism for the releasible securement of said tray at different positions relative to said side walls of the box with the crayons extending downwardly supported by the bottom wall and extending upwardly above the said holder tray,

an elongated latch member having a longitudinal axis,

biasing means mounting the latch member on the holder tray for limited angular movement about its said axis between first and second angular positions of the latch member,

said biasing means interconnecting the box and the latch member, and said biasing means biasing the latch member to said first angular position,

at least one projection on the latch member extending transversely of said latch member axis,

means defining at least one groove communicating with and extending along said bore and adapted to receive said latch member projection to allow relative axial movement between the holder tray and the box when the latch member is in its second angular position wherein said projection is in registration with said groove, and

means defining a first ledge adjacent to and extending radially of said bore and adjacent to and generally perpendicular to said groove for receiving the latch member projection to prevent relative axial movement between the holder tray and the box when the latch member is in its first angular positions and in a first axial position relative to said bore,

whereby the holder tray and the box are secured together when the latch member is in its said first position, and manual movement of the latch member from its said first to its said second angular position allows relative movement between the latch member and said bore for separation of the holder tray and the box.

4,519,499

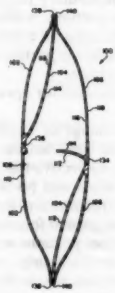
CONTAINER HAVING A SELECTIVELY OPENABLE SEAL LINE AND PEELABLE BARRIER MEANS

Albert Stone, Buffalo Grove; Edwin Pyde, Des Plaines, and Peter Carveth, Glen Ellyn, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jun. 15, 1984, Ser. No. 619,647

Int. Cl.³ B65D *25/08*

U.S. Cl. 206—219 **14 Claims**



1. A container having at least three chambers for the separate storage and selective mixing of at least two components, said container comprising:

(a) a first sheet;

(b) a second, diaphragm sheet sealed about at least a portion of its periphery to said first sheet and to a third sheet, said second, diaphragm sheet being intermediate said first sheet and said third sheet;

(c) said first sheet and said third sheet sealed about their entire peripheries and forming the exterior wall of said container;

(d) a first externally, manually breakable line of securement between said first sheet and said second, diaphragm sheet;

(e) a second externally, manually breakable line of securement between said first sheet and said second, diaphragm sheet, wherein said first and second breakable lines of securement extend entirely across said container;

(f) at least said first sheet, said first breakable line of securement and said second, diaphragm sheet defining a a first chamber for holding the first component;

(g) at least said second sheet, said third sheet and said first and second breakable lines of securement defining a second chamber;

(h) at least said first sheet, said second breakable line of securement and said second, diaphragm sheet defining a third chamber;

(i) whereby manual separation of said first and second sheets

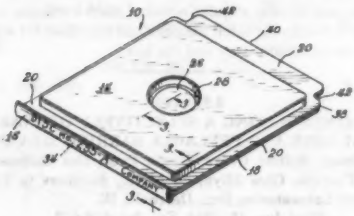
near said first and second breakable lines of securement will rupture said breakable lines of securement and said second sheet, placing said first, second and third chambers in open communication.

4,519,500

DISPLAY/STORAGE PACKAGE AND FILE THEREFOR

William C. Perchak, Chicago, Ill., assignor to Plastofilm Industries, Inc., Wheaton, Ill.

Filed Jan. 12, 1984, Ser. No. 570,226
Int. Cl.³ B65D *83/00, 85/30, 1/34*
U.S. Cl. 206—312 **13 Claims**



1. A display/storage package for flat articles, comprising
a. a bottom portion,
b. a top portion complementary to said bottom portion,
c. said top and bottom portions, when engaged to constitute a closed package, forming an internal compartment,
d. means for securing said top portion to said bottom portion to form a closed package,
e. means providing assistance for opening the package when closed, and
f. a peripheral planar flange of flexible material encircling said top portion and said bottom portion, each flange being located on the respective top and bottom portions so as to be in contact when said portions are closed,
g. a combination label retainer and handle constituting continuations of said flanges and forming a hinge for connecting said top and bottom portions at one edge thereof, said combination further including continuations of said flanges transverse to said planar flanges so as to define a handle and a longitudinal channel forming a guideway for retaining indicia identifying the contents of the package.

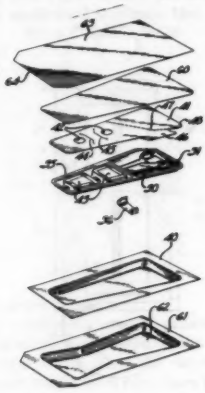
4,519,501

LIGATING CLIP AND CLIP APPLIER PACKAGE

Robert J. Cerwin, Pittstown, N.J., assignor to Ethicon, Inc., Somerville, N.J.

Continuation-in-part of Ser. No. 284,413, Jul. 20, 1981,. This application Apr. 21, 1983, Ser. No. 487,437
The portion of the term of this patent subsequent to Nov. 1, 2000, has been disclaimed.
Int. Cl.³ B65D *85/24*
U.S. Cl. 206—339 **3 Claims**

1. A package comprising:
(a) a sterile instrument for applying a plurality of ligating clips;
(b) means disposed within said instrument for holding a plurality of said ligating clips in spaced apart relationship to facilitate dispensing of the clips sequentially;
(c) a plurality of sterile, dry, hydrolyzable surgical ligating clips disposed in spaced apart relationship in said holding means, each of said clips having a narrowed resilient hinge portion, said hinge portions being more sensitive to hydrolysis than the remainder of said clip;
(d) absorbing means adjacent to said holding means said absorbing means having a greater affinity for moisture than any portion of said clip whereby any moisture present in said package, including moisture in the area around each clip, is preferentially absorbed by said absorbing means, said absorbing means having sufficient absorbent capacity to maintain the clips dry and sterile while in the unopened package;
(e) and moisture impermeable outer wrap disposed in sealing relationship with respect to the instrument the holding



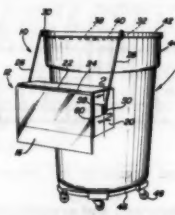
means, clips, and moisture absorbing means, whereby said initially dry and sterile clips are maintained dry and sterile until the package is opened to maintain the resiliency of the hinge portion of the clips for an extended shelf life period.

4,519,502

RACK FOR BOXED PLASTIC BAG ROLLS

John C. Jackson, II, and Robert N. Schendle, both of Monroe, La., assignors to Sunbelt Plastics, A Division Of Sunbelt Manufacturing, Inc., Monore, La.

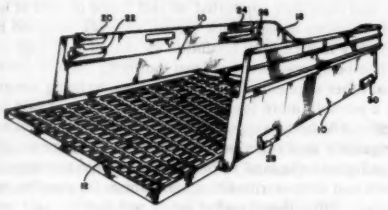
Filed Feb. 16, 1984, Ser. No. 581,113
Int. Cl.³ B65D *83/00, 85/672;* **B65B** *67/04*
U.S. Cl. 206—390 **8 Claims**



5. In combination, a carton having a roll of plastic bags therein and a slot enabling the plastic bags to be dispensed from the roll, said roll of plastic bags including a hollow core with the roll of bags and core extending horizontally between vertical end walls of the carton with the end walls of the carton having apertures aligned with the core when oriented centrally of the carton, a supporting rack engaged with the carton and including means for engaging a supporting structure, said rack comprising a pair of spaced legs having free ends engaged with the carton, the free end of each leg including an inwardly extending extension having a reversely curved inner end portion and a resilient and outwardly diverging portion terminating in a laterally opening recess with the extension received through the aperture in the end wall of the carton and extending into the core when the outwardly diverging portion of the extension is moved toward the extension with release of the outwardly diverging portion of the extension engaging the

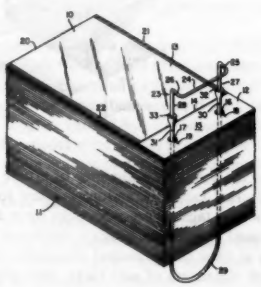
laterally opening recess into locking engagement with the periphery of the aperture in the end wall of the carton and the inner end portion of the extension in the core.

4,519,503
NESTABLE/STACKABLE BASKET/TRAY COMBINATION FOR USE IN BAKERY GOODS DISTRIBUTION SYSTEMS
James D. Wilson, 421 Vista Suerte, Newport Beach, Calif. 92660
Filed Aug. 15, 1983, Ser. No. 523,179
Int. Cl.³ B65D *21/04*
U.S. Cl. 206—505 **5 Claims**



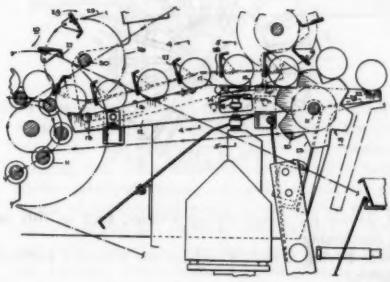
1. A container comprising a basket formed of molded plastic material and constructed to be stacked on like baskets to form a rack, said basket having a rear wall and first and second side walls integral with one another and with said rear wall, and said basket further having an open bottom and an open front; inwardly extending flanges integral with said side walls and extending along the bottom edges thereof; and a tray slidably supported on said flanges to form a bottom for said basket, said tray being adapted to be pulled out through the open front of the basket.

4,519,504
WICKET BAG PACKET
Joseph A. Nausedas, Oak Forest, Ill., assignor to Union Carbide Corporation, Danbury, Conn.
Continuation of Ser. No. 454,482, Dec. 29, 1982,. This application Sep. 11, 1984, Ser. No. <49,292
Int. Cl.³ B65D *71/00*
U.S. Cl. 206—554 **4 Claims**



1. A wicket bag packet comprising, in combination:
(a) a stack of flattened, flexible packaging bags, each of said bags having an open end and having a pair of wicket holes provided in a portion thereof adjacent to said open end; and
(b) a wicket including a substantially U-shaped rigid uper member having a pair of elongated leg sections adapted to pass through said pair of wicket holes provided in each bag and a substantially U-shaped flexible lower member having a pair of elongated leg sections extending through said pair of wicket holes provided in each bag and holding together the entire stack of packaging bags, said rigid upper member extending outwardly beyond said stack of packaging bags and having its elongated leg sections joined contiguously with the elongated leg sections of said flexible lower member forming a continuous loop whereby a selected number of bags may be taken from said stack of packaging bags and guided along said rigid upper member to a separate packaging location.

4,519,505
EGG TRANSFER SYSTEM
Leslie P. Thomas, Canton, Mich., assignor to Diamond Automations, Inc., Framington, Mich.
Continuation-in-part of Ser. No. 394,443, Jul. 1, 1982,. This application Dec. 23, 1982, Ser. No. 452,451
Int. Cl.³ A01K *43/08*
U.S. Cl. 209—513 **41 Claims**



15. An apparatus for advancing eggs from a candling station through a plurality of weighing stations in an egg grading apparatus, said apparatus including conveying means for conveying eggs through said egg candling station, comprising,
elongated guide means for receiving eggs from said candling station and guiding said eggs to said weighing stations of said grading apparatus, said guide means being disposed adjacent one end of said conveyor means downstream of said candling station for receiving eggs from said conveyor means,
said guide means further including at least one first portion which is inclined upwardly in the direction of movement of said eggs on said guide means toward said weighing stations, and at least one second portion which is inclined downwardly in the direction of movement of said eggs on said guide means away from said egg weighing stations, the end of said first portion of said guide means and the beginning of said second portion of said guide means being located ahead of said weighing stations in the direction of movement of said eggs on said guide means, said second portion having an angle of inclination with respect to the horizontal which is less than that of said first upwardly inclined portion,
first advancing means, disposed vertically above said guide means and adjacent thereto, adapted to individually engage and advance said eggs along said guide means to said weighing stations, said weighing stations being disposed along said guide means so that eggs are advanced over said weighing stations by said advancing means,
a plurality of egg holding stations onto which said eggs are advanced by said advancing means, said holding stations being disposed in alignment with and downstream of said guide means and said egg weighing stations, and
lifting means, adapted to engage a plurality of said eggs from the underside thereof and lift said eggs from said holding stations, said lifting means being rotatably and reciprocally movable with respect to said egg holding stations, the rotational movement of said lifting means being about

an axis which is generally parallel to the longitudinal axis of said guide means so as to facilitate the engagement and lifting of said eggs by said lifting means during upwardly rotational movement thereof.

4,519,506

ROTARY WEIGH-SORTER

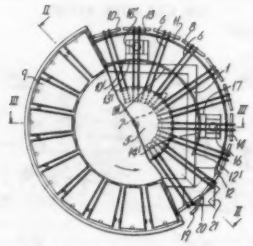
Spaanderman Cornelis, Vlaardingen, Netherlands, assignor to Internationale Octrooi Maatschappij "Octropa" B.V., Rotterdam, Netherlands

Filed Aug. 12, 1982, Ser. No. 407,541

Claims priority, application United Kingdom, Aug. 12, 1981, 8124701

Int. Cl.³ B07C 5/16

U.S. Cl. 209—592 **1 Claim**



1. A device for weigh-sorting articles, such as fish, said device comprising:

a frame having a vertical axis means rotatably supported therein;

a driving turret attached to said vertical axis means for rotation therewith;

a plurality of containers for said articles and a respective plurality of arms;

each arm having a first, radially inner pivot connection pivotally connecting a respective said arm to said driving turret about a horizontal pivot axis so that the respective arm projects generally horizontally and radially outwards from said driving turret so that said arms radially outwardly of said driving turret require support from beneath in order to be kept from tilting downwards;

each arm further having a second, radially outer pivot connection pivotally connecting a respective said container to a respective said arm so that each said container is pivotable with respect to the respective said arm to which it is pivotally connected, between a first position wherein it is generally uprightly disposed to receive and contain at least one of said articles, and a second position wherein it is generally outwardly tilted for dumping therefrom at lest one of such of said articles as may be contained thereby;

at least two load cells mounted to said frame at angularly spaced locations about said driving turret;

a track means extending in a plurality of separate segments generally circumferentially about said driving turret including at least one such segment on said frame and at least another such segment respectively on each of said load cells, said track means being arranged in relation to said arms and in relation to said containers to at least indirectly support said containers as said driving turret is rotated, so that as the driving turret is rotated through a complete revolution, each said container is successively brought to bear successively upon each of said load cells;

a mechanism carried on said frame and constructed and arranged for successive interaction with said containers for temporarily tilting an article-containing said container from said first to said second position thereof for dumping at least one contained article therefrom, said mechanism being spaced angularly about said frame from said at least two load cells;

a computing means constructed and arranged for comparing container weight-related data from at least two of said load cells correlated with respective ones of sid containers in relation to successive weighings of that container by said at least two load cells in a same revolution of said power turret with data stored in said computing means relative to acceptable net weights for articles contained by said containers, and for causing said temporarily tilting mechanism to operate in regard to a weight-related determination made thereby;

said load cells being so angularly spaced from one another about said frame that a site is provided angularly therebetween at which articles may be directed into successive ones of said containers, so that as said power turret is rotated, each container is successively brought from being at least indirectly supported on said frame on said at least one segment of said track means, to being weighed in a possibly more empty condition by one of said load cells while being supported at least indirectly on a respective said other segment of said track means, to being weighed in a possibly more full condition by another of said load cells while being supported at least indirectly on another respective said other segment of said track means after passing said site, and to being brought into juxtaposition with said temporarily tilting mechanism for possible temporary tilting thereby after being weighed by said other said load cell.

4,519,507

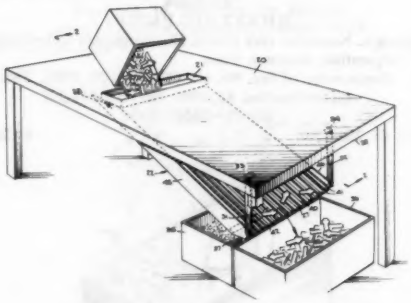
APPARATUS FOR SEPARATING TACKS FROM SURVEILLANCE TAGS

Dennis Gillette, Ft. Lauderdale, and David Gentzler, Boynton, both of Fla., assignors to Sensormatic Electronics Corporation, Deerfield Beach, Fla.

Filed Nov. 15, 1982, Ser. No. 441,657

Int. Cl.³ B07C 5/12

U.S. Cl. 209—682 **8 Claims**



1. Apparatus for use with a quantity of article surveillance tags and unattached tacks in random mixture for separating said tacks from said tags where said tacks have a head and a shank and are used to fasten said tags to fabric, or the like, and said tags have at least one principal dimension that is larger than the largest dimension of said tacks, said apparatus comprising a bi-level ramp having an upper level a predetermined height above a lower level, means for suspending said ramp beneath a work surface having an opening for introducing said mixed quantity of tags and tacks to one end of said ramp, said one end of said ramp being elevated relative to its other end, said other end being supported above a support surface such that a pair of receptacles can be disposed beneath said other end in position to receive articles traversing the respective levels of said ramp, a plurality of apertures in the upper level of said bi-level ramp larger than the greatest dimension of said tacks for freely permitting a tack to pass through said upper

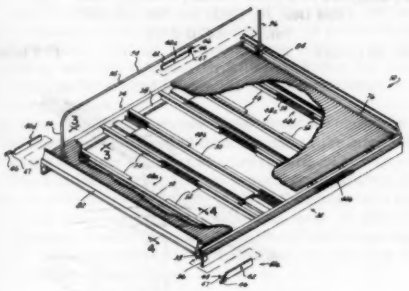
level of said ramp to the lower level of said ramp, said apertures being sized and shaped such that said tags can, for a selected orientation, and in the absence of any other impediment, pass therethrough, said predetermined height between said lower and upper level of said ramp being insufficient to permit complete ingress of a tag, said suspending means being constructed to support said ramp with a sufficient inclination to cause tacks to slide along the upper level until they pass through one of said apertures and to continue to slide along the lower level to an outlet from which they are guided into any receptacle underlying said outlet, and means for elevating above the surface of said upper level of said ramp a majority of those tags that are introduced to the top of said ramp while slidingly conveying said tags down the ramp to a second outlet for deposit in any receptacle underlying said second outlet, said tag elevating means being constructed to permit substantially unimpeded movement of said tacks along said upper level toward said apertures.

4,519,508

SHELF STRUCTURE FOR A DISPLAY RACK

Edwin P. Gullett, Fayetteville; Gerald B. Davis, Clarkston, and Rafael T. Bustos, Atlanta, all of Ga., assignors to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jun. 8, 1983, Ser. No. 502,294
Int. Cl.[3] A47F *5/00*
U.S. Cl. 211—59.2 **19 Claims**



1. A shelf structure for supporting articles in a display rack having corner posts, comprising:

opposed, spaced shelf support arms each formed with an outwardly facing channel;

cross members extending between said shelf support arms and connected thereto, said cross members being adapted to telescope between an extended and retracted position for varying the space between said shelf support arms;

an article support carried by said adjustable cross members and shelf support arms, said article support including a top surface and a bottom surface each having different coefficients of friction, said article support being adapted to be turned over so as to dispose either of said surfaces upwardly for contacting said articles; and

latch elements movable within said outwardly facing channels of said shelf support arms, said latch elements being adapted to releasably connect to said corner posts for connecting said shelf structure to said display rack.

4,519,509

CLOTHES-LINE

Rexford Doyle, 135 Laurier St., North Alma, Quebec, Canada

Filed Jul. 9, 1984, Ser. No. 629,166
Claims priority, application Canada, Aug. 2, 1983, 433708
Int. Cl.[3] B65G *25/00*; **D06F** *53/00*
U.S. Cl. 211—119.13 **4 Claims**

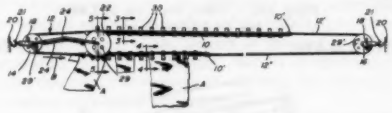
1. A clothes-line and clothes pin assembly comprising:

(a) a first and a second pulley each adapted to be supported at horizontally-spaced-apart points;

(b) an endless clothes-line stretched out and trained on said pulleys to form upper and lower runs;

(c) a sprocket wheel rotatably supported in the plane of said line and held nearer said first pulley than said second pulley;

(d) a cable secured at both its ends to said clothes-line, trained around said sprocket wheel and extending alongside said clothes-line, a horizontal portion of the lower run of said clothes-line extending between said first pulley and said sprocket wheel forming a cable-free loading and unloading zone, so that garments may be draped over said line and removed therefrom, said zone at one end forming a junction with said cable where the latter joins with said lower run;



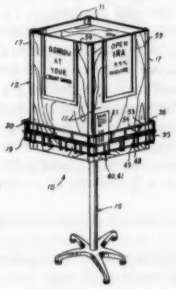
(e) a row of spaced-apart clothes pins, each fixedly connected to said cable and each carrying a line-gripping means movable relative to its clothes pin between a line-gripping and a line-releasing position, each clothes pin further carrying a biasing means biasing said line-gripping means to line-gripping position, said clothes pins successively engaging said sprocket wheel when travelling with said cable around said sprocket wheel, and the latter having a surface means contacting said gripping means and moving the latter to the line-releasing position when said clothes pin is engaging said sprocket wheel, whereby movement of said lower run of said line will impart rotation to the sprocket wheel to successively present clothes pins at said junction with their gripping means in line-releasing position for engaging the lower end of said line together with a garment draped thereon, said clothes pin automatically securing said garment on said line when said clothes pin leaves said sprocket wheel.

4,519,510

ROTATABLE DISPLAY STAND

Stanley J. Learnard, 12659 Willow Spring Ct., Herndon, Va. 22070

Filed Jun. 26, 1984, Ser. No. 624,778
Int. Cl.[3] A47F *5/02*
U.S. Cl. 211—131 **14 Claims**



1. A rotatable article display stand, comprising:

a pedestal base;

a generally horizontal frame plate rotatably supported on top of said pedestal base;

a plurality of substantially vertical, generally rectangular panels fixed to the peripheral edge of said frame plate and defining a generally box-like structure;

wire members secured to said panels around the outside thereof in the vicinity of said frame plate, defining a plurality of pockets for holding and displaying advertising brochures, pamphlets and the like, said wire members also reinforcing said structure; and

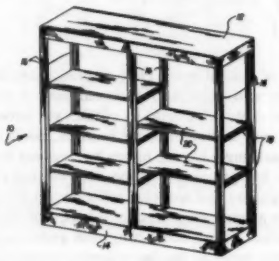
corner members extending vertically along the corners of said box-like structure, fixed to the adjacent edges of the panels and securing them together.

4,519,511

SHELF SUPPORTING BRACKET ARRANGEMENT

Walter M. Mendenhall, 512 Lillian Dr., Madeira Beach, Fla. 33708

Filed Jul. 6, 1982, Ser. No. 395,482
Int. Cl.³ A47F 5/00
U.S. Cl. 211—187 **8 Claims**



1. Apparatus for use in supporting a shelf or the like, comprising a pair of spaced apart longitudinally extending channel members having respective longitudinally extending slots disposed in facing relation with each other, a crosspiece extending between said pair of channel members, said crosspiece having integral end portions which extend through the facing slots and into said channel members, and a plurality of support means longitudinally spaced within each of said channel members for engaging and supporting the end portions of said crosspiece within the channel member to support the end portions of the crosspiece when the crosspiece is in a first orientation relative to the channel members, the crosspiece being turnable to a second orientation relative to the pair of channel members while its end portions are disposed within said pair of channel members, the end portions of the crosspiece being released from engagement with the support means in the pair of channel members when the crosspiece is in said second orientation, the end portions of the crosspiece being longitudinally movable in the pair of channel members while the crosspiece is in its second orientation to change the position of the crosspiece relative to the pair of channel members, each of said pair of channel members defining a longitudinally extending guideway, the support means in each channel member projecting into the guideway for engaging and supporting an end portion of a crosspiece disposed therein when the crosspiece is in said first orientation, the end portions of a crosspiece which extends within a guideway in a channel being dimensioned to

(i) slide in both longitudinal directions in the guideway when the crosspice is in its second orientation,

(ii) turn in the guideway as the crosspiece turns between its first and second orientations, and

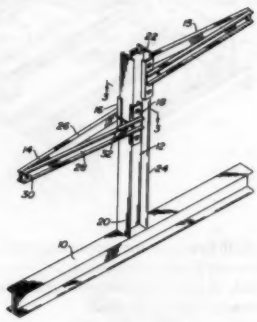
(iii) rest on a support means in the guideway when the crosspiece is in its first orientation, each of the facing slots in the channel member having a predetermined width, and the guideway in each channel member having a predetermined width which is greater than the width of the slot in the respective channel member, each of the end portions of the crosspiece including a relatively narrow neck portion which has a width which is less than the predetermined width of the slots in the channel members and a relatively wide support portion which has a width which is greater than the predetermined width of the slots in the channel members, and the support means in each channel member projecting into the guideway in the channel member at a location outside the width of the slot associated with that channel, the end portions of the crosspiece and the guideways in the channel members being dimensioned to allow relatively unobstructed longitudinal movement of an end portion of a crosspiece in the guideway in a channel member when the crosspiece is in its second orientation, each channel member including first and second coplanar front walls which are spaced apart from each other and define the longitudinal slot in the channel member, and each support means in the channel member comprising at least one support member projecting into the guideway in the channel member from at least one of said first and second front walls in the channel member.

4,519,512

CANTILEVER RACK CONSTRUCTION

Donald Frazier, Calderwoods, Farhills, N.J. 07931; J. Hartley Daniels, Bethlehem, Pa., and Daniel W. Clapp, Hackettstown, N.J., assignors to Donald Frazier, Farhills, N.J.

Filed Dec. 20, 1982, Ser. No. 450,511
Int. Cl.³ A47D 5/10
U.S. Cl. 211—193 **17 Claims**



1. A cantilever rack construction comprising:

a vertical column including a generally vertically extending web and flange, said flange having portions extending in both directions from said web, each flange portion having an outer face and an inner face,

a cantilever arm, and

a pair of connectors for mounting said cantilever arm on said flange of said column to extend generally perpendicularly from the outer faces of said flange portions,

each of said connectors being secured to said arm and adapted to be mounted on said column at one of said flange portions,

each of said connectors comprising a first rigid portion constructed and arranged to grip the outer face of an associated flange portion at a limited medial location between the tip of said flange portion and said web and away from said tip, and

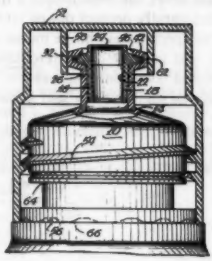
a second rigid portion constructed and arranged to grip the inner face of said associated flange portion at a limited medial location between the tip of said flange portion and said web and away from said tip.

4,519,513

CONTAINER HAVING PIERCEABLE INSERT

Gerhard H. Weiler, South Barrington, and Louis T. Pagels, Hanover Park, both of Ill., assignors to Automatic Liquid Packaging, Inc., Arlington Heights, Ill.

Filed Aug. 30, 1982, Ser. No. 412,608
Int. Cl.³ B65D *41/20*
U.S. Cl. 215—32 **22 Claims**



1. A form, fill and seal container of a thermoplastic material, comprising:

(a) a body portion defining an opening at one end;

(b) an insert having a member defining a passageway and having a membrane sealing the passageway, said membrane having a thickness of about 0.010 inches or less; and

(c) a retaining structure unitary with the body portion about the defined opening, the insert being received by and sealing with the retaining structure such that the membrane can be pierced to provide access to the interior of the body portion;

said insert including an annular flange about the periphery of the insert member, spaced from the end of the insert, and having an upper surface and a lower surface, at least one of said surfaces being of a frustoconical configuration; and

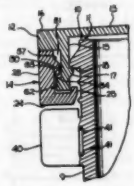
said retaining structure extending about the flange with a lip on the retaining structure extending over at least the peripheral portion of the upper surface of said flange from the outer periphery of said flange but spaced from the inner edge of said flange.

4,519,514

TAMPER RESISTANT AND TAMPER EVIDENT CLOSURES

Albert J. Agbay, Worcester, Mass., and Ralph H. Thomas, Sr., Clark, N.J., assignors to Robert Linkletter Associates, Inc., Westboro, Mass.

Filed Mar. 20, 1984, Ser. No. 591,541
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—225 **4 Claims**



1. A safety closure for a container having a rim defining a mouth, a neck located below said rim, and a peripheral lip around said rim, said closure comprising:

a snap cap having a top overlying said mouth and said rim and having a depending annular flange projecting below said top, said flange having an inwardly directed circumferential bead engaged below said lip, and a first outwardly directed circumferential bead located below said top and cooperating therewith to define a circumferential locking groove extending around the outer side of said flange;

a rotary safety ring having an annular sidewall surrounding said flange and overlying said locking groove and said first outwardly directed circumferential bead, said annular sidewall being closely spaced to said locking groove and said first outwardly directed circumferential bead so that said inwardly directed bead is held in engagement with said lip and prevents removal of said cap;

a plurality of angularly spaced fingers on the inner side of said sidewall projecting into said locking groove and overlying the bottom wall of said locking groove to prevent downward movement of said ring along said cap, said fingers being inclined inwardly and downwardly into said locking groove and having free inner ends positioned to be wedged against the bottom of the locking groove to prevent free flexing of the fingers as the ring is pulled downwardly relative to the cap, thereby normally preventing downward movement of said ring out of overlying relation with said locking groove;

a plurality of longitudinally extending release grooves in said first outwardly directed circumferential bead, spaced and sized to permit movement of said fingers through said first outwardly directed circumferential bead in one angular position of said ring about said cap, and thus allowing downward movement of said ring away from said cap for the removal of the latter from the container in said one angular position; and

a tear tab attached to said neck below said safety ring, said tab being attached so that it can be broken off said neck, the upper portion of said tab being positioned closely below said safety ring preventing said ring from being unlocked as long as said tear tab is attached to said neck,

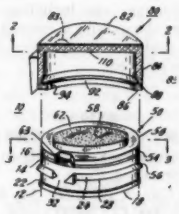
whereby said closure cannot be opened without removing said tear tab.

4,519,515

DISC FOR INDICATOR FOR TAMPER-EVIDENT LID

Milton Schonberger, One Century Tower, Fort Lee, N.J. 07024

Continuation-in-part of Ser. No. 549,975, Nov. 9, 1983, which is a continuation-in-part of Ser. No. 484,636, Apr. 13, 1983, Pat. No. 4,480,760, which is a continuation-in-part of Ser. No. 451,794, Dec. 21, 1982, abandoned. This application Dec. 7, 1983, Ser. No. 558,807
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—230 **18 Claims**



1. An indicator arrangement for a tamper-evident container lid, comprising:

a disc for being applied to the open neck of a container; the disc being comprised of a layer of resilient foam material which is adapted to deform when pressure is applied to it and which resiliently self biases to restore itself from being deformed; the disc having a bottom for being applied on the neck of a container; the disc having a top; an indicator

on the top of the disc and adapted for providing a visible indication when the indicator is rubbed;

a lid for being placed over the neck of the container and over the top of the disc; the lid having an underside above and opposed to the indicator; and

indicator rubbing means at the lid underside for being rubbed over the indicator as the lid is rotated around the neck of the container and with respect to the disc for activating the indicator on the disc; and the foam material being resilient for urging the indicator toward the rubbing means at the underside of the lid.

4,519,516

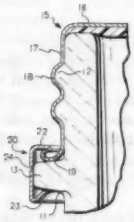
TAMPER INDICATING PACKAGE

Charles W. Amos, Bowling Green, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Jan. 26, 1984, Ser. No. 573,985

Int. Cl.³ B65D *41/34*

U.S. Cl. 215—252 **8 Claims**



1. A tamper indicating package comprising

a container having a neck with external threads thereon,

a radial flange beneath the threads,

a closure having a top wall and a peripheral skirt with internal threads on the peripheral skirt complementary to the threads on the container,

said closure having a radially extending lip at the free end of the peripheral skirt,

and a tamper indicating band comprising a continuous annular wall, an upper radially inwardly extending flange for engaging the lip on the closure, and a lower generally radially inwardly and upwardly extending flange for engaging the flange on the container,

said lower flange being discontinuous such that the tamper indicating band can be applied to the closure and container after the closure has been applied to the container by moving the band axially downwardly and causing the lower flange to flex radially outwardly and then snap radially inwardly beneath the flange of the container,

said tamper indicating band including weakened portions such that when the closure is rotated to remove the closure from the container, the lift force of the threads causes the band to be severed.

4,519,517

TAMPER INDICATOR FOR CLOSURE

John Walter, Evergreen Park, Ill., assignor to Continental Can Company, Inc., Stamford, Conn.

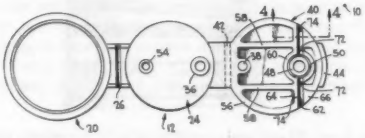
Filed Nov. 9, 1982, Ser. No. 440,398

Int. Cl.³ B65D *55/06*

U.S. Cl. 215—253 **10 Claims**

1. A closure of the type including a closure member having attached thereto a lever for applying a removing force to said closure member, said lever being normally generally planar; the improvement residing in providing said lever with deformable hinge means for causing a permanent displacement of a free end portion of said lever, said deformable hinge means extending transversely across said lever relative to the direction of force application by said lever whereby after said lever has been folded from its closed position and returned thereto said free end portion of said lever will unnaturally project out of said generally planar state to indicate tampering.

2. A closure of the type including a closure member having attached thereto a lever for applying a removing force to said closure member, said lever being normally generally planar; the improvement residing in providing said lever with deformable hinge means extending transversely across said lever relative to the direction of force application by said lever whereby after said lever has been folded a free end portion of said lever will unnaturally project out of said generally planar state to indicate tampering, said hinge means including a transverse hinge line and at least one stretchable web extending longitudinally of said lever and transversely of said hinge line for resisting return of said lever to said generally planar state.



9. A closure of the type including a closure member having attached thereto a lever for applying a removing force to said closure member, said lever being normally generally planar; the improvement residing in providing said lever with deformable hinge means causing a permanent displacement of a free end portion of said lever, said deformable hinge means extending transversely across said lever relative to the direction of force application by said lever whereby after said lever has been folded said free end portion of said lever will unnaturally project out of said generally planar state to indicate tampering, said lever being initially held in said generally planar state by rupturable retaining means including a tear-out segment of said lever, said hinge line being on transversely opposite sides of and interrupted by said tear-out segment.

4,519,518

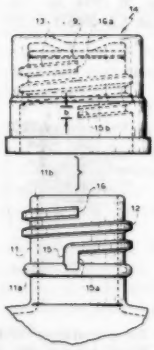
MEANS FOR MOUNTING A CLOSURE IN A PREDETERMINED POSITION

Laurence E. Wiles, Cheshire, and Frank C. Page, III, Watertown, both of Conn., assignors to Specialty Packaging Products, Inc., Bridgeport, Conn.

Filed May 31, 1984, Ser. No. 615,937

Int. Cl.³ B65D *41/04*

U.S. Cl. 215—331 **10 Claims**



1. A container and closure assembly comprising

(a) a threaded neck portion on said container which includes

at least one external helical thread having an upper non-helical stop surface and at least one external helical thread having a lower non-helical stop surface;

(b) a closure having at least one internal mating helical thread having an upper non-helical stop surface and at least one internal helical thread having a lower non-helical stop surface;

whereby said upper and lower stop surfaces of said external and internal helical threads respectively contact each other to stop the threading rotation of said closure on said neck portion at a predetermined position.

4,519,519

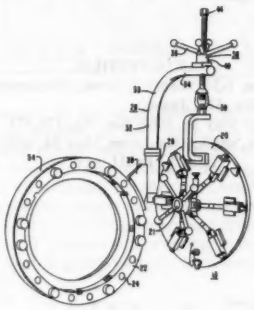
FUEL TRANSFER TUBE QUICK OPENING HATCH

Robert E. Meuschke, Penn Hills; Donald G. Sherwood, Monroeville, and Bernard L. Silverblatt, Pittsburgh, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 26, 1982, Ser. No. 352,601

Int. Cl.³ B65D *55/00;* **G21C** *19/00*

U.S. Cl. 220—211 **6 Claims**



5. A quick operating hatch assembly for sealing and unsealing an opening at an outer peripheral end of a transfer tube located in a lower portion of a containment pit of a nuclear reactor building, wherein said opening is surrounded by a circumferential weldment, comprising:

a locking ring connected to said weldment;

a hatch cover fitably received within said locking ring and having a base portion seatable onto said weldment;

locking assembly means including latching means movably connected with said hatch cover, housing means in said locking ring, and latching means movable means connected with said hatch cover and said latching means for movement thereof into locking engagement with said housing means for locking said hatch cover to said locking ring and out of engagement with said housing means for releasing said hatch cover from said locking ring whereby to permit removal of said hatch cover from said locking ring to provide access to the transfer tube; and

external drive connection means normally not connected to, and remotely operable from a location above the containment pit to be remotely connected to and detached from said latching means movable means and operable when so connected to remotely and selectively drive said latching means movable means in a direction to affect correspondingly either closure or opening of said latching means from a location external of said pit; and

a davit assembly pivotally coupled with said weldment and means coupled to said hatch cover for pivotally moving said hatch cover away from the transfer tube after release therefrom and for initially aligning said hatch cover with the transfer tube prior to locking thereto, said coupling means including an acme threaded screw rotatably coupled to said davit assembly for raising and lowering the hatch cover, and means coupled to said acme threaded screw for rotation thereof and operable from a location above the containment pit substantially above the elevation of the davit assembly to affect such rotation.

4,519,520

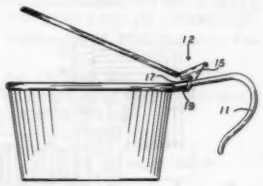
VESSEL LID ATTACHMENT

Charles A. Hill, 4641 Mt. Forde Ave., San Diego, Calif. 92117

Filed Aug. 20, 1984, Ser. No. 642,096

Int. Cl.³ B65D *43/26*

U.S. Cl. 220—263 **3 Claims**



1. An improved lid attachment of the type used to attach a lid to a vessel formed from a metal stamping having a rim crimped around a length of wire, a bent U-shaped loop of which protrudes from two slots in the rim to form a handle, wherein the improvement comprises:

a hinge pin formed from a second length of wire which connects both sides of said wire handle near said rim;

a hinge-lever integral with said lid having two parallel slotted tabs which slide over said hinge pin;

4,519,521

TAPE CASSETTE

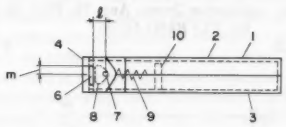
Tetsuji Yoshii, Neyagawa, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 31, 1984, Ser. No. 646,212

Claims priority, application Japan, Sep. 6, 1983, 58-164452; Oct. 13, 1983, 58-191165; Nov. 10, 1983, 58-211329; Dec. 9, 1983, 58-233057; Apr. 24, 1984, 59-82167; Apr. 24, 1984, 59-82168

Int. Cl.³ B65D *85/672*

U.S. Cl. 220—335 **21 Claims**



1. A tape cassette comprising a cassette body having an opening part on one side thereof and a -chape cover which makes opening-closing of said opening part, and including a pair of rotary shafts for said cover provided on the sides of the -shape cover, a pair of engaging holes being in the shape of a triangle which is tapering rearward, and a urging means for urging said rotary shaft toward rear of the cassette body.

4,519,522

APPARATUS AND METHOD FOR STORING AND RETRIEVING ARTICLES

J. Russell McElwee, Charlotte, N.C., assignor to Photo Vending Corporation, Charlotte, N.C.

Filed Jul. 6, 1981, Ser. No. 280,502

Int. Cl.³ G07F *11/00*

U.S. Cl. 221—13 **14 Claims**

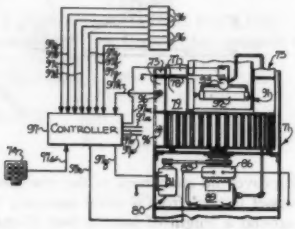
10. A method for storing articles of a unique nature in a storage device having a plurality of individual receptacles mounted for movement past a predetermined retrieval point

and for automatically retrieving any particular desired article, said method comprising

labeling each article which is to be stored with a label bearing an electronically readable identification code for that particular article which uniquely identifies that article and distinguishes it from all others and which has no pre-established correlation to any of the receptacles in the storage device,

selecting any unoccupied receptacle in the storage device and placing the article which is to be stored therein,

electronically reading directly from the label of the article which is to be stored the identification code for that article



and electronically storing in a programmable memory device the identification code of that article and the corresponding location of the particular receptacle in which the article is placed, and thereafter

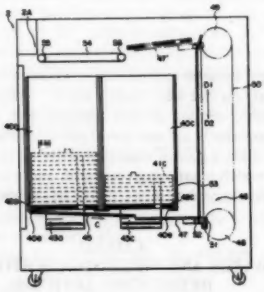
retrieving any selected article by electronically receiving input of the identification code for that article and electronically retrieving from the programmable memory device the stored receptacle location corresponding to the input identification code and in response thereto effecting movement of the receptacles past said predetermined retrieval point until the particular receptacle containing the desired article is positioned at the retrieval point.

4,519,523

SHEET PACKET DISCHARGING APPARATUS

Hiroshi Ohba, and Shigeo Horino, both of Tokyo, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 26, 1982, Ser. No. 411,960
Claims priority, application Japan, Aug. 28, 1981, 56-135047
Int. Cl.³ B65G *59/06*
U.S. Cl. 221—129 **5 Claims**



1. A sheet packet discharging apparatus comprising:

at least one packet accommodating case accommodating a stack of packets each bound by a band and having an outlet provided at one end;

a sheet packet transport path;

sheet packet feed-out means disposed below said sheet packet accommodating case for feeding out a sheet packet in the stack in a longitudinal direction of the band from said sheet packet accommodating case to the sheet packet transport path, said sheet packet feed-out means including conveyor means movable in the direction of feeding out the sheet packet, said conveyor means including a conveyor belt movable in the direction of feeding out the sheet packet, a first portion of said conveyor belt having a plurality of protuberances projecting in a row therefrom and a second portion of said conveyor belt being without said protuberances, said conveyor means cooperating with said outlet so that said protuberances maintain said packets in said packet accommodating case and said second portion allows one packet to be released from said packet accommodating case, said second portion having a length greater than that of the stack of sheet packets in the direction of the band, the leading part of said protuberances pushing said one packet in said second portion to said sheet packet transport path; and

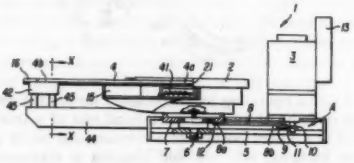
means provided on said sheet packet transport path for transporting and discharging a sheet packet fed out by said feed-out means on said transport path to a sheet packet discharging outlet.

4,519,524

PARTS FEEDER

Yoshiyuki Hirose, 7-24, Hirose 2-chome, Shimamoto-cho, Mishima-gun, Osaka, 618, Japan

Filed May 14, 1982, Ser. No. 378,171
Claims priority, application Japan, May 14, 1981, 56-073224
Int. Cl.³ B65H *9/00*
U.S. Cl. 221—167 **5 Claims**



1. A parts feeder comprising:

a horizontally rotatable bowl having a conveying track on an interior surface thereof;

a motor coupled to drive said bowl in a horizontal rotatable oscillatory vibration, wherein said bowl rotates in a first and second direction, the acceleration of said bowl in said first direction being greater than in said second direction; and

at least one in-line trough having a basal part slidingly coupled to an exit of said conveying track and being slidingly supported thereof so as to be longitudinally moveable;

wherein a portion of said in-line trough is formed into a linear article transfer section for formation in-line of articles therein.

4,519,525

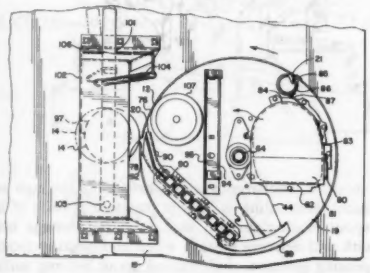
SEED DISPENSER FOR PLANTERS

Nicholas H. Wunschl, Bolingbrook, and Edward L. Robinson, Jr., Naperville, both of Ill., assignors to J. I. Case Company, Racine, Wis.

Filed Jun. 1, 1981, Ser. No. 268,966
Int. Cl.³ A01C *7/04*
U.S. Cl. 221—211 **7 Claims**

1. In a seed dispenser for a planter of the type comprising a stationary, generally vertical wall, a seed selector drum rotatably mounted about a generally horizontal axis in a sealing relationship against said wall, said drum having a cylindrical periphery with a plurality of openings therein and an open end adjacent said wall, means for rotating the drum, means for

supplying seeds to the drum, a seed release means disposed to contact the outer periphery of said drum, means for delivering air under pressure to the interior of said drum such that seeds are held in the interior sides of said openings by the air pressure differential thereacross until the seed release means is encountered by the openings during drum rotation, and seed receiving means within said drum periphery for gravitationally receiving seeds released from said drum openings, said seed receiving means having an outlet external of the drum such that received seeds are conveyed to said external outlet by the air flow



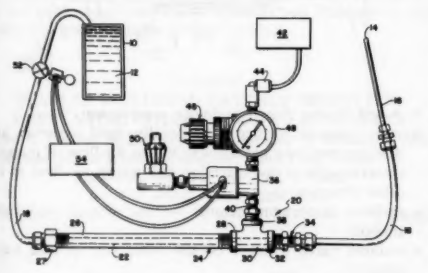
therethrough created by the air pressure differential between the exterior and interior of said drum, the improvement wherein said seed release means is disposed to release said seeds inwardly from said interior sides of said openings in said drum surface at substantially 90° after top center of the drum and said seed receiving means having an elongated inlet disposed adjacent to the inner periphery of said drum and starting in advance of the 90° position and extending to the 90° position and a passage extending downwardly from said inlet toward said outlet.

4,519,526

METHOD AND APPARATUS FOR DISPENSING LIQUID

Gary Hillman, Livingston, N.J., assignor to Machine Technology, Inc., Whippany, N.J.

Filed Mar. 25, 1982, Ser. No. 361,803
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—212 **20 Claims**



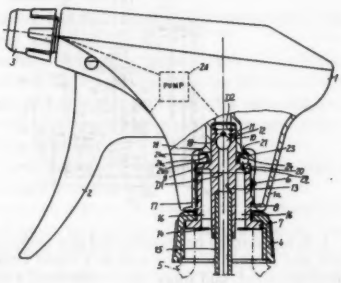
1. A suck-back assembly for use with liquid dispensers, comprising a housing; conveying means for conveying liquid to be dispensed, said conveying means including a resiliently deformable conduit passing through said housing and a constantly open dispensing tip; pressurizing means for pressurizing said housing; and regulating means for regulating the pressure within said housing between a first predetermined pressure at which said conduit is crimped solely by the forces applied directly to it as a result of said housing being at said first predetermined pressure and a second predetermined pressure at which said conduit is substantially uncrimped, whereby the volume of said conduit is increased when said conduit returns to its substantially uncrimped state from its crimped state to thereby create a vacuum in said conduit sufficient to suck back liquid which is being dispensed from said constantly open dispensing tip.

4,519,527

HAND POWERED LIQUID ATOMIZER

Karlheinz Kläeger, Portnerstr. 84, 8902 Neusaess, Fed. Rep. of Germany

Filed Jul. 19, 1983, Ser. No. 515,317
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227150; Dec. 9, 1982, 3245493
Int. Cl.³ B05B *9/043*
U.S. Cl. 222—383 **5 Claims**



1. In a hand powered liquid atomizer which includes a pistol-like housing; a union nut supported adjacent a lower end of a handle part of said housing, said nut being designed to be screwed onto a neck of a liquid vessel; a synthetic resin holding part which is generally cylindrical and has a flange at its lower end which supports said nut, said handle part of said housing having a generally cylindrical pocket in which said holding part is sealingly seated, said holding part further having therethrough a middle hole joined up with a length of flexible pipe adapted to extend into the vessel; a diaphragm which forms a check valve for letting air into the vessel, is provided on said holding part, and is made of an elastic material; a pump positioned within said housing; and a pump lever for operating said pump; the improvement comprising wherein said holding part is stepped and made of an elastic material, and has a first cylindrical part with a large diameter which is joined by way of an annular shoulder with a cylindrical headpiece having a diameter smaller than said large diameter, said headpiece having said middle hole extending therethrough and being located above said first cylindrical part; wherein said pocket in said housing has an annular step therein which separates a first part of said pocket which receives said first cylindrical part of said holding part from a second part of said pocket which has a small diameter and receives said headpiece; wherein said step of said pocket has at least one air inlet hole extending therethrough and communicating with a location outside said pocket; wherein said annular shoulder of said holding part is spaced from said step of said pocket and has an air hole extending therethrough and communicating with the inside of the vessel; and wherein said elastic diaphragm is located in a space between said shoulder of said holding part and said step of said pocket, said diaphragm being molded on and integral with one of said shoulder of said holding part and said headpiece thereof so that said diaphragm is seated elastically against said step and covers said air inlet hole therein.

4,519,528

LIQUID SPRAYING HEAD

Paul Comment, Courgenay, Switzerland, assignor to Guy Favrot, Oberengstringen, Switzerland

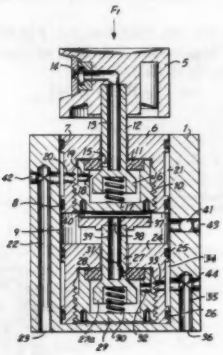
PCT No. PCT/CH80/00006, § 371 Date Sep. 19, 1980, § 102(e) Date Sep. 19, 1980, PCT Pub. No. WO80/01482, PCT Pub. Date Jul. 24, 1980

PCT Filed Jan. 15, 1980, Ser. No. 207,974

Claims priority, application Switzerland, Jan. 22, 1979, 606/79

Int. Cl.³ B05B *11/06*

U.S. Cl. 222—396 **9 Claims**



1. A liquid spray head connected to a compressed-gas reservoir and adapted to be secured to a vessel containing a liquid to be atomized, said spray head comprising a body, means for securing said body to said vessel and for connecting said spray head to said compressed-gas reservoir, two superposed and coupled valves, a pressure-reducing expansion device and a safety device in said body, said superposed valves comprising an upper valve having a movable valve member comprising a hollow upper shank with a pushbutton and spray nozzle at its upper end, and a lower valve having a movable valve member comprising a lower shank aligned with but separate from said upper shank, spring means urging said lower shank toward said upper shank, and spring means interposed between said lower shank of said lower valve and said upper shank of said upper valve, said lower valve having an inlet connected with said compressed gas reservoir and an outlet connected with said pressure reducing expansion device, said pressure reducing expansion device having an inlet connected with said lower valve and an outlet connected with the interior of said vessel, and said upper valve having an inlet connected with a lower region of said vessel and an outlet connected through said hollow shank of said upper valve with said spray nozzle.

4,519,529

DISPENSING STOPPER

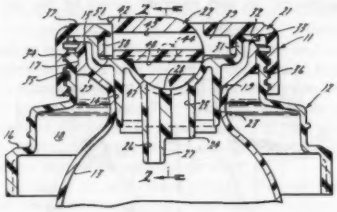
Charles L. Seltz, Gurnee, Ill., assignor to King-Seeley Thermos Co., Norwich, Conn.

Continuation of Ser. No. 087,421, Oct. 22, 1979, abandoned, and a continuation-in-part of Ser. No. 847,901, Nov. 2, 1977, abandoned. This application Apr. 14, 1981, Ser. No. 253,946

Int. Cl.³ B67D *3/00*

U.S. Cl. 222—484 **14 Claims**

1. A dispensing closure for a bottle or the like having an opening comprising a lower piece adapted to register with the bottle opening, said lower piece defining a curved bearing surface, a delivery passage extending through said bearing surface and terminating in registry with the bottle opening for delivery of the bottle contents through said delivery passage, an upper piece fixed relative to said lower piece, said upper piece having a curved surface facing said curved bearing surface of said lower piece, and a pouring spout positioned at least in part between said upper and lower pieces, said pouring spout having a bearing surface engaging said lower piece bearing surface for pivotally supporting said pouring spout relative to said pieces for movement between a closed position and a dispensing position, and a surface engaged by said upper piece surface for urging said bearing surfaces into engagement whereby said bearing surfaces define the pivot axis of said



pouring spout, a discharge passage extending through said pouring spout terminating at least in part in a portion of said pouring spout bearing surface, said discharge passage being aligned with said delivery passage when said pouring spout is in its dispensing position, said pouring spout bearing surface having a portion disposed in engagement with said delivery passage when said pouring spout is in its closed position for closing said delivery passage.

4,519,530

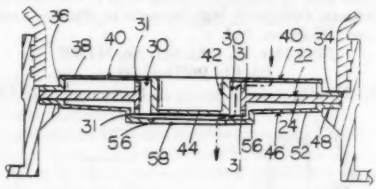
SELF-CLOSING DISPENSER

Gerhard S. E. Schmidt, 208 Duplex Ave., Toronto, Ontario, Canada

Filed Feb. 25, 1983, Ser. No. 469,945

Int. Cl.³ B05B *11/04*

U.S. Cl. 222—494 **6 Claims**



1. A self-closing dispenser device comprising;

a valve support formed of generally rigid material, and defining two-way passageway means for flow of material therethrough in one direction and return air flow in the other direction;

a resilient diaphragm member on one side of said valve support;

a resilient valve member on the other side of said valve support;

porting means in said diaphragm member, whereby said material may flow between said diaphragm member and said valve support;

a valve stem connected to said diaphragm member and extending through said two-way passageway means and having a valve closure surface;

a dispensing opening in said valve member, said opening being normally closed by contact with said valve closure surface and said valve member being movable outwardly away from said valve closure surface for ejection of material, and said valve stem and closure surface being movable inwardly away from said valve member to permit re-entry of air, and,

stop means on said valve support for limiting movement of said valve stem, and of said valve member as aforesaid.

4,519,531

PLEATING MACHINE FOR PLEATING CLOTH WITH MUTUALLY CONVERGING FOLDS

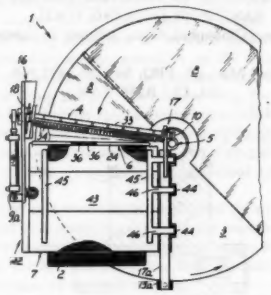
Giordano Clerici, Via Fernando Santi, 5, 20056 Trezzo Sull-'Adda, Milano, Italy

Filed Jun. 7, 1984, Ser. No. 618,246

Claims priority, application Italy, Jun. 29, 1983, 21848 A/83; Oct. 10, 1983, 23229 A/83

Int. Cl.³ A41H *43/00*

U.S. Cl. 223—30 **14 Claims**



1. A pleating machine for pleating cloth with mutually converging folds, comprising: a working platform, an angularly oscillating entrainment arm on said platform adapted to impart a cloth placed on said platform with a step-like forward movement, a lifting abutment wall adapted to contact said cloth adjacently a travel limit position of said arm, and guide members effective to guide pleated cloth and being located adjacent said wall on the opposite side to said arm, characterized in that said abutment wall and said arm are both configured comb-like at least in part so as to be mutually interleaved, and in that control and guiding devices are provided for said abutment wall to be subjected to cyclic oscillation along a path leading said abutment wall to an inserted position in said arm after moving over and past a cloth flap which has been folded over by said arm and effective to then press said flap against said guiding members for the pleated cloth.

4,519,532

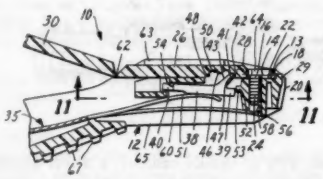
STAPLER INCLUDING RATCHET MEANS FOR PREVENTING DOUBLE FEEDING OF STAPLES

Floyd L. Foslien, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Feb. 28, 1983, Ser. No. 470,066

Int. Cl.³ A61B *17/04;* B25C *5/02*

U.S. Cl. 227—8 **7 Claims**



1. In a stapler comprising:

a housing having a passageway extending from an inlet opening to an outlet opening, said openings and passageway being adapted to guide a single open staple moved from the inlet to the outlet opening;

means for biasing a stack of staples into said inlet opening;

a ram having an end portion adapted to engage a said staple and being mounted on said housing for sliding movement between a load position with the ram spaced from the inlet opening to afford movement of one of the staples into the passageway, along said passageway with said end portion pushing the staple, to an eject position at which the end portion of the ram has pushed the staple to said outlet opening; said ram having a length adapted so that a portion thereof will be positioned adjacent said inlet opening during movement of said ram from said load to said eject position to prevent movement of a second staple into said passageway through said inlet opening;

drive means adapted for manual activation to move said ram along said passageway, thereby moving one of the staples from said inlet opening through said passageway and to said outlet opening; and

means for biasing said ram toward said load position, the improvement wherein:

said stapler includes antireverse means for preventing movement of said ram toward said load position from a position intermediate said load and eject positions until said ram has been moved fully to said eject position, said antireverse means comprising:

an elongate pawl including front and rear portions, and a tooth projecting from one side;

surfaces on said ram defining an elongate recess adapted to receive said tooth, said surfaces including a front surface adjacent the end portion of said ram and a rear surface defining the end of said recess opposite said front surface;

mounting means mounting said pawl on said housing generally parallel with said ram with said front portion adjacent said outlet opening and said tooth in said recess for longitudinal sliding movement relative to said housing, from (1) an engage position at which said pawl is positioned with the front surface of the recess contacting said tooth when said ram is in said load position and at which the pawl is positioned during movement of said ram a substantial portion of the distance toward said eject position until said rear surface of said recess contacts said tooth, (2) to a lockout position more closely adjacent said outlet opening than said initial position to which said pawl is moved by contact between said rear surface and said tooth during a final portion of the movement of said ram to said eject position and at which the pawl is maintained during a major portion of the movement of the ram back to the load position, and (3) back to said engage position to which said pawl is moved by contact between said front surface and said tooth during the final portion of movement of said ram from said eject back to said load position;

means for biasing said tooth toward said recess;

surface means including at least one abutment surface on said tooth and latching surfaces defining said recess between said front and rear surfaces for affording, when said abutment and latching surfaces are in engagement, movement of said ram toward said eject position while preventing movement of said ram toward said load position; and

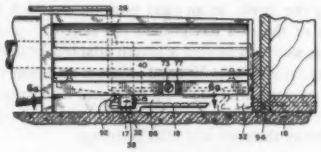
means for affording engagement of the abutment surface of said tooth with the latching surface of said recess under the influence of said biasing means when said pawl is in said engage position, for moving said abutment and latching surfaces out of engagement as said pawl is moved from said engage to said lockout position, and for maintaining said abutment and latching surfaces out of engagement when said pawl is in said lockout position.

4,519,533

APPARATUS FOR DRIVING OFFSET FASTENERS

Andre Jirovetz, Sturgeon Bay, Wis., assignor to Fal-Kon Investment Group, Sturgeon Bay, Wis.

Filed Apr. 22, 1983, Ser. No. 487,684
Int. Cl.³ B25C *1/04*
U.S. Cl. 227—109 **14 Claims**



1. An apparatus for driving offset fasteners of the type comprising an elongated shank, a head at one end of the shank, and a portion offset from the centerline of the shank being intermediate the head and the shank, the apparatus comprising:

a piston;

a piston housing enclosing the piston;

said piston housing also defining a staging position from which offset fasteners may be driven; and

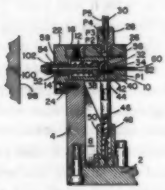
a striker bar attached to the piston for driving a fastener in said staging position, said striker bar including a striker member positioned such that the striker member contacts the offset of said offset fastener when the striker bar drives the offset fastener.

4,519,534

PIN INSERTING MACHINE

William P. White, c/o Mechanical Applications, Inc., Wiscasset, Me. 04578

Filed Aug. 1, 1983, Ser. No. 519,135
Int. Cl.³ B25C *5/02, 5/06*
U.S. Cl. 227—117 **4 Claims**



1. A machine for driving a pin into a horizontal hole in the vertical face of an adjacent work piece, said machine comprising

a supporting body,

a pin receiving rotor mounted for rotation on a horizontal axis in said body,

a hole extending dimetrically through said rotor,

means for feeding a succession of pins one at a time to said when in a vertical position,

means for rotating said rotor 90° to place said hole and pin therein in a horizontal position,

a horizontal pin guide slidingly mounted in said body at right angles to the axis of said rotor,

spring means constantly urging said pin guide toward said rotor,

said pin guide having a bore therethrough aligned with the hole in said rotor when said hole has been turned from the vertical position to the horizontal position with a pin therein,

a horizontal punch for driving said pin from said horizontally positioned rotor hole into said pin guide bore while said pin guide is stationary,

resilient stop means in said pin guide bore adapted to be engaged by and to temporarily stop movement of said pin through said bore as said pin is being advanced by said punch,

said pin guide adapted to be advanced by said punch acting against the said pin then in engagement with said resilient stop means and simultaneously compressing said spring means until the said pin guide engages said work piece and whereby

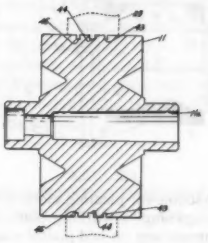
continued movement of said punch in said bore forces said pin past said resilient stop means and into said horizontal hole in said work piece.

4,519,535

FLYWHEEL FOR AN ELECTRO-MECHANICAL FASTENER DRIVING TOOL

John P. Crutcher, Cincinnati, Ohio, assignor to Sencorp, Cincinnati, Ohio

Filed Mar. 29, 1983, Ser. No. 479,964
Int. Cl.³ B25C *1/06*
U.S. Cl. 227—131 **19 Claims**



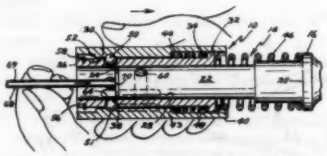
1. In an improved electro-mechanical fastener driving tool of the type having a driver and an electrically driven flywheel, together with a support element to engage said driver and move said driver through a working stroke, the improvement comprising a flywheel containing at least one circumferential groove formed about the periphery of said flywheel whereby to provide at least one void along the flywheel-driver contact line into which foreign material on said driver and said flywheel flows to prevent a build-up of said foreign material thereon and consequent loss of friction therebetween.

4,519,536

APPARATUS FOR DRIVING NAILS USING AN IMPACT HAMMER

William A. Steigauf, 400 - 7th S.W., Faribault, Minn. 55021

Filed Mar. 1, 1984, Ser. No. 585,203
Int. Cl.³ B25C *5/13, 7/00*
U.S. Cl. 227—147 **18 Claims**



1. For use with an impact hammer, a driver assembly for holding and driving nails having heads of predetermined transverse dimension, said driver assembly including:

A. a driver shaft operably associated with the impact hammer to receive and transmit hammer-action blows from the hammer, said driver shaft having:

(1) an elongated impact hammer-engaging shank having a rear end portion supported in said impact hammer,

(2) an elongated driver integrally connected to, extending forwardly from, and concentric with said shank and having a nail driving surface at a front end thereof, said nail driving surface lying in perpendicular relation to a longitudinal axis of the driver shaft;

B. an intermediate bolt keeper sleeve slidably mounted in encompassing relation to the driver, said bolt keeper sleeve being partially defined by elongated, mutually parallel inner and outer surfaces;

C. an outer sleeve slidably and concentrically mounted on the bolt keeper sleeve, said outer sleeve being partially defined by an elongated inner surface parallel to, and in sliding contact with the bolt keeper sleeve outer surface;

D. first bias means operative on the driver shaft and on the bolt keeper sleeve to bias the bolt keeper sleeve to tend to move along the driver in forward direction;

E. second bias means operative on the outer sleeve and on the bolt keeper sleeve to bias the outer sleeve to tend to move along the bolt keeper sleeve in forward direction;

F. said bolt keeper sleeve being provided with at least one detaining bolt receiving opening extending radially therethrough, on a radial axis lying in perpendicular relation to and passing through the longitudinal axis of the driver shaft;

G. at least one round ended nail head detaining bolt situated in said bolt receiving opening, the minimum dimension of said bolt receiving opening being at the bolt keeper sleeve inner surface and being less than the maximum transverse dimension of the bolt therein;

H. the dimensions and configuration of the bolt, the thickness of the bolt keeper sleeve and the minimum dimension of the keeper sleeve bolt receiving opening being such that the outermost surface of the bolt will be substantially flush with said bolt keeper sleeve outer surface and the innermost surface of the bolt will lie on the periphery of an imaginary circle, concentric with the driver shaft and of lesser diameter than the predetermined dimension of the heads of the nails to be held and driven when the bolt protrudes as far as possible through the inner surface of the bolt keeper sleeve;

I. the outer sleeve and the bolt keeper sleeve each being partially defined by annular front end surfaces lying in planes perpendicular to said driver shaft axis, said outer sleeve being provided with at least one detaining bolt receiving detent cavity open through its inner surface and positioned to be in alignment with said detent bolt receiving opening in said bolt keeper sleeve when said front end surfaces of said outer and intermediate sleeves lie in a common plane, the size and shape of said outer sleeve detent cavity being such that the detaining bolt, when aligned with its detent cavity, can be snugly fitted into said cavity to lie entirely outside of the bolt keeper sleeve inner surface.

4,519,537

PROCESS FOR HYDROGEN-IMPERMEABLE BRAZING OF AUSTENITIC STRUCTURAL STEEL PARTS

Hans Heinrich, Eslingen, and Dieter Hedrich, Schwabisch Gmund, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

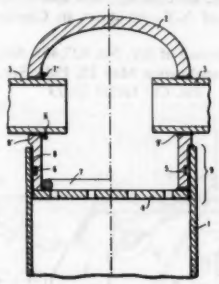
Filed May 4, 1983, Ser. No. 491,450

Claims priority, application Fed. Rep. of Germany, May 6, 1982, 3216934

Int. Cl.³ B23K *1/04, 1/19*

U.S. Cl. 228—221 **10 Claims**

1. A process for the hydrogen-impermeable brazing of austenitic steel parts comprising loosely joining the steel parts at soldering points, with the addition of effective amounts of solder and soldering agents adapted to the soldering point, soldering the steel parts at a soldering temperature in a furnace under vacuum, using a vacuum of up to about 10^{-3} mbar in the furnace and using two different solders, applying these solders separately to the soldering point, one of the solders comprising a nickel-base solder with about 1–3% by weight of boron and 2–5% by weight of silicon, and the other solder comprising a



bronze solder with a copper-tin-base, wherein the nickel-base solder constitutes about 20 up to 30% by weight of the total amount of solder.

4,519,538

PACKING AND DISPLAYING CARTON, AND BLANK PLATE THEREFOR

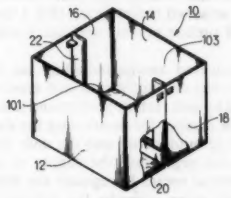
Namio Omichi, 5-29-12, Hongo, Bunkyo-ku, Tokyo, Japan

Filed Jun. 14, 1984, Ser. No. 620,600

Claims priority, application Japan, Aug. 12, 1983, 58-124502[U]

Int. Cl.³ B65D *5/48*

U.S. Cl. 229—27 **5 Claims**



1. A packing and displaying carton with two neighboring compartments, which comprises a front panel connected to one side of a first bottom panel; a first pair of two side panels, each connected to remaining opposite sides of said front panel and connected to remaining opposite sides of said first bottom panel; a rear panel connected to one side of a second bottom panel; a second pair of two side panels, each connected to remaining opposite sides of said rear panel and connected to remaining opposite sides of said second bottom panel; a first reinforcing panel, one side thereof being connected to a remaining side of said first bottom panel and opposite sides being connected to remaining side of each side panel for said first pair; and a second reinforcing panel, one side thereof being connected to a remaining last side of said first reinforcing panel, another side opposing to the first side being connected to a remaining side of said second bottom panel, and remaining two sides being connected to remaining side of each side panel for said second pair; said reinforcing panels being connected each other with a weakened line and having an area surrounded by another weakened line.

4,519,539

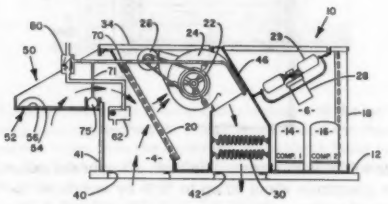
METHOD AND APPARATUS FOR REGULATING AN ECONOMIZER DAMPER USING INDOOR FAN AIR PRESSURE

Rudy C. Bussjager, Chittenango, and James J. Del Toro, N. Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 427,405, Sep. 29, 1982, abandoned. This application May 23, 1984, Ser. No. 613,471

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—13 **11 Claims**



4. An air conditioning unit including a refrigeration circuit and an economizer, said unit having an indoor section with an indoor fan for discharging air from the unit to the enclosure to be conditioned, said indoor section receiving air to be conditioned from the enclosure and from the economizer and a damper for regulating the volume of outdoor air flow into the unit through the economizer which comprises:

conduit means positioned to receive pressurized air being discharged from the indoor fan;

the damper including a bottom plate defining spaced openings and a top plate also defining spaced openings said bottom and top plates slidable relative to each other whereby when any portion of the openings in the bottom plate are in registration with any portion of the openings in the top plate outdoor ambient air will flow through the economizer, said top plate having a surface portion attached thereto and said bottom plate having a fixed surface portion attached thereto such that a space is defined between said surface portion and said fixed surface portion;

air pressure powered means including an inflatable bag connected to the conduit means and coacting with said space formed by said surface portion and said fixed surface portion of the damper for positioning the damper to control the flow of outdoor air into the unit; and

control means for regulating the supply of air to the air pressure powered means to regulate the relative position of said slidable plates whereby the volume of air passing through said slidable plates is controlled by their relative position.

4,519,540

SEALED GAS HEATER WITH FORCED DRAFT AND REGULATION BY MICROPROCESSOR

Franck Boulle, Lagny sur Marne, and Michel Zveguintzoff, Chatenay-Malabry, both of France, assignors to Societe Anonyme Saunier Duval eau Chaude Chauffage - S.D.E.C.C., Montreuil, France

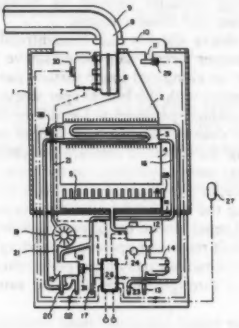
Filed Aug. 13, 1982, Ser. No. 408,126

Claims priority, application France, Aug. 27, 1981, 81 16373

Int. Cl.³ F24H *3/06*

U.S. Cl. 237—7 **11 Claims**

1. A control device for a simple or mixed gas boiler with forced draft in which a sealed enclosure encloses a burner, a heating body, an evacuation hood for the burned gases and an extraction fan, fresh air that is needed for the combustion of the burner being admitted from an air distribution box placed at the upper section of said enclosure, said boiler including a burner gas inlet, electrovalve that is connected to a disconnecting box, a reverse valve distributing primary water either towards a long circuit during the heating operation, or towards a short circuit during a drawing, a circulation pump and a lighter, the boiler being furthermore equipped with a plurality of sensors or detectors that are designed to collect temperature, output or operation data, characterized by the fact that the overall control, safety and uninterrupted dependency functions of air output to gas output are ensured by a control box (**26**) with a microprocessor which centralizes the data received from the various sensors, converts them into digital signals ready to operate the lighter (**24**), the circulation pump (**19**), the gas inlet electro valve (**12**) and the extraction fan (**6**), according to control data that are pre-programmed and memorized by the microprocessor.



4,519,541

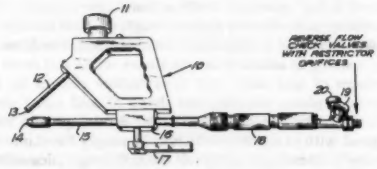
TORCH FLAME SPRAY SYSTEM

Anthony J. Rotolico, Hauppauge, N.Y., assignor to Eutectic Corporation, Flushing, N.Y.

Filed Nov. 8, 1982, Ser. No. 439,813

Int. Cl.³ B05B *17/00*

U.S. Cl. 239—1 **2 Claims**



1. In a method for operating a flame spray system comprising a torch assembly having a gas mixing chamber and valve means for feeding fuel gas and valve means for feeding oxygen to said mixing chamber in a preselected proportion; the improvement which comprises,

providing each of said valve means with an orifice restrictor of size predetermined to pass through gas at a predetermined choked state,

passing fuel gas and oxygen, respectively, through said orifice restrictors at an oxygen/fuel-gas flow ratio and pressures corresponding to optimum BTU capacity for a particular flame characteristic calculated in terms of BTU's per hour with the pressures maintained in excess of minimum choking pressure for each of said restrictors,

said flame characteristic being one selected from the group consisting of (a) a slightly oxidizing flame, (b) a neutral flame and (c) a slightly reducing flame,

and maintaining the excess choking pressure of the gas flow through each of the orifice restrictors during thermal

operation of said flame spray system in accordance with the flame conditions observed during operation of said flame spray system without substantially changing the predetermined flame chemistry of said flame spray system during operation thereof.

4,519,542

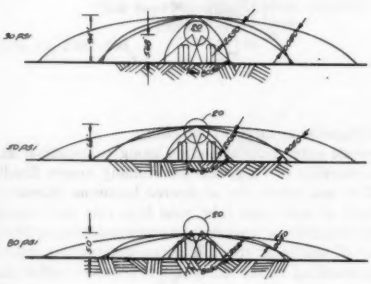
BOOMLESS, SPRAYER FOR FIELD APPLICATION FOR AGRICULTURAL LIQUIDS

Douglas Johnston, Decatur, Ala., assignor to John Blue Company, a Division of Burnley Corporation, New York, N.Y.

Continuation of Ser. No. 286,704, Jul. 24, 1981, abandoned. This application Mar. 27, 1984, Ser. No. 594,404

Int. Cl.³ B05B *9/06, 17/04*

U.S. Cl. 239—1 **27 Claims**



19. A boomless method of applying agricultural liquids to the ground at a predetermined rate, in amount per unit area, the steps comprising:

supplying nozzle means with the liquid under pressure at an adjustable rate, in amount per unit time, to generate a spray;

moving the nozzle means horizontally over the ground with moving vehicle means while confining the nozzle means within the lateral outlines of the vehicle means and directing the nozzle means to emit the spray generally laterally of the direction of the movement of the nozzle means so that the spray will impact the ground in a pattern generally in the shape of a narrow band moving transversely of its length, which length is the swath width of the pattern; the rate of the liquid supply being proportional to the speed of the movement;

the nozzle means being constructed so that the swath width of said pattern and the distance thereof from the nozzle means varies in accordance with (a) the pressure of the liquid supplied to the nozzle means over a predetermined range of such pressures and (b) the above-ground height of the nozzle means; and

adjusting the above-ground height of the nozzle means for correspondence with the pressure of the liquid supplied thereto in order to maintain substantially constant the swath width of said pattern and the distance thereof from the nozzle means.

4,519,543

VECTORABLE NOZZLES FOR TURBOMACHINES

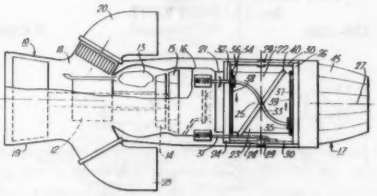
Gary F. Szuminski, Marietta, Ga., and Thomas J. Jones, Bristol, England, assignors to Rolls-Royce Inc., New York, N.Y. and Rolls-Royce Limited, London, England

Filed Apr. 7, 1982, Ser. No. 376,388

Int. Cl.³ B63H *11/10*

U.S. Cl. 239—265.19 **6 Claims**

1. A vectorable nozzle for a turbomachine comprising: a first duct; a second duct mounted in a first bearing for rotation about its longitudinal axis relative to the first duct, the second duct terminating at its downstream end in a plane that lies at an angle to the axis of rotation of the second duct; a third duct mounted in a second bearing for rotation about its longitudinal axis relative to the second duct, the third duct having its upstream end parallel to the downstream end of the second duct; a seal means for effecting a gs tight seal between the second



and third ducts; constraining means for constraining the second bearing to swing bodily about an axis transverse to the length of the first duct; and means to rotate the second duct about its axis of rotation and operable to rotate the third duct in the opposite direction to that of the second duct in synchronism with the rotation of the second bearing bodily about the axis transverse to the first duct.

4,519,544

PORTABLE LAWN AND GARDEN SPRINKLER SYSTEM

Laszlo Szabo, Payne Ave., San Jose, Calif. 95130

Filed Apr. 29, 1983, Ser. No. 489,726

Int. Cl.³ B05B *15/06*

U.S. Cl. 239—279 **9 Claims**

1. A sprinkler comprising:

a base assembly including inlet means adapted to receive the end of a garden hose, a pair of outlet means, and primary manifold means for distributing water from said inlet means to said pair of outlet means, said pair of outlet means being pivotally attached to the remainder of said base assembly to permit independent pivotal motion; and

a pair of arm assemblies associated, one each, with respective ones of said pair of outlet means, each arm assembly including a first tubular member having a lower end coupled to one of said pair of outlet means, a second tubular member having a lower end portion telescopically engaged with an upper end portion of said first tubular member, and a first sprinkler means coupled to an upper end of said second tubular member.

4,519,545

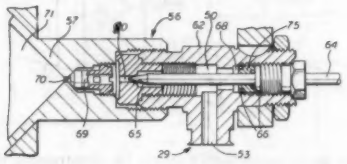
SPRAY APPLICATOR FOR SPRAYING COATINGS AND OTHER FLUIDS IN SPACE

Jerome F. Kuminecz, and Merlyn F. Lausten, both of Houston, Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,094

Int. Cl.³ B05B *9/047*

U.S. Cl. 239—288 **8 Claims**



1. A totally self-contained spray gun for one handed use in a vacuum zero-gravity environment application of a coating material, comprising:

(a) an accumulator means including a rigid outer shell and a flexible bladder contained therein having an outlet port, pressurized propellant contained within the outer shell exteriorly of the bladder, whereby the constricting force exerted by the propellant on the bladder and the liquid coating material contained therein induces the coating material to be extruded through said outlet port under zero-gravity conditions;

(b) a conduit (passageway) having a first end connected to the outlet port of the accumulator, said conduit including an externally controllable shut off plug mounted therewithin for allowing or preventing the outflow of coating material, said conduit further including a removable strainer means sealed and mounted therewithin for filtering out large coagulated particles of coating material;

(c) spray gun means for controlling the explosion of coating material including a housing connected to a second end of the conduit, a handle for gripping and supporting the spray gun and accumulator, and a spring loaded self-locking trigger means having an open and closed position, so arranged with respect to the handle as to permit simultaneous one-hand gripping of the handle and operation of the trigger means;

(d) said trigger means including a lever having a first end pivotally mounted on the spray gun handle assembly, said lever being substantially parallel to the handle of the spray gun housing when the trigger means is in a closed position, and whereby the pivoting of the level toward the handle places the trigger means in an open position;

(e) said trigger means further including simultaneous locking and unlocking means for preventing accidental movement of the trigger means, the locking means including:

(i) a spindle mounted in the spray gun housing;

(ii) a trigger lock annularly mounted on the spindle;

(iii) a spring mounted on the spindle whereby said spring is torsionally resistant to rotational movement of the lock with respect to the spindle;

(iv) a recess formed in the lever so as to receive and engage the lock, said lock being capable of one-handed rotational movement with respect to the spindle, whereby pivotal movement of the lever towards the handle is only permitted when the lock is rotationally oriented so as to engage the recess;

(f) valve means mounted within the spray gun housing responsive to the position of the trigger means for controlling the outflow of the coating material from the accumulator;

(g) support means for rigidly connecting the spray gun handle and the accumulator; and

(h) spray shield means mounted on the spray gun means for restricting back spray of the liquid coating.

4,519,546

DRIP IRRIGATION APPARATUS

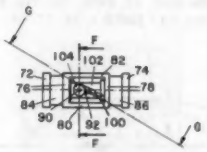
Moshe Gorney, and Eldad Dinur, both of Kibbutz Naan, Israel, assignors to Naan Mechanical Works, Israel

Filed Jul. 8, 1982, Ser. No. 396,409

Claims priority, application Israel, Jul. 15, 1981, 63341

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—542 **19 Claims**



1. Drip irrigation apparatus comprising:

a continuous outer tube extending along longitudinal axis and a plurality of flow rate determining inserts fixedly joined to said outer tube at desired locations therealong interiorly of said outer tube, said flow rate determining inserts each defining a water inlet communicating with the interior of said outer tube, flow rate determining means, flow controlling means responsive to pressure within said outer tube and water outlet means extending over a significant portion of the circumference of said outer tube in engagement therewith, a water exit from said outlet means being defined by perforation of said outer tube at said water outlet means, said water outlet means being axially displaced from said flow controlling means, whereby accuracy of perforation location within said water outlet means cannot affect operation of said flow controlling means.

4,519,547

INJECTION VALVE

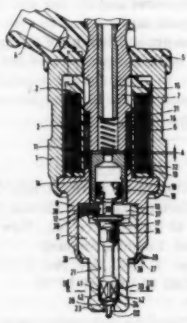
Hans Kubach, Korntal-Münchingen; Wolfgang Kienzle; Werner Paschke, both of Schwieberdingen, and Rudolf Sauer, Benningen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 13, 1982, Ser. No. 434,194

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225180

Int. Cl.³ F02M *51/06*

U.S. Cl. 239—585 **8 Claims**



1. An injection valve for fuel injection devices for mixture-

compressing internal combustion engines with externally supplied ignition comprising a valve body, a valve needle guide bore in said valve body, a valve seat in said valve body, an electromagnetically actuated valve needle, said valve needle including a sealing part cooperating with said valve seat and first and second guide sections on said valve needle upstream of said valve seat for guiding the valve needle in said guide bore, characterized in that said first guide section of the valve needle is disposed immediately upstream of and adjacent the sealing part, a metering section formed on said first guide section which serves to meter the quantity of fuel delivered by said injection valve, and an axially aligned injection port surrounding an end portion of said valve needle.

4,519,548

INSECTICIDE DUSTER

Norman L. Farmer, Rte. 1, Box 280, Abbeville, S.C. 29620

Filed Sep. 30, 1982, Ser. No. 429,075
Int. Cl.³ A01C *7/02*
U.S. Cl. 239—652 **3 Claims**

1. An insecticide duster for dusting plants with an insecticide comprising:

an elongated plastic tubular member;

a woven bag-like member carried adjacent a lower end of said tubular member;

means for securing an open-end of said bag-like member adjacent said lower end of said tubular member;

said bag-like member being a loosely woven synthetic fabric, a vinyl coating provided on said fabric adding sufficient stiffness to said bag-like member causing said bag-like member to extend substantially straight out from said lower end of said tubular member when said tubular member is held in a substantially horizontal position and to be tucked in said tubular member when not in use, and sealing caps placed over the ends of said tubular member for storing said insecticide.

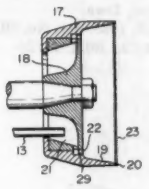
4,519,549

ELECTROSTATIC COATING PROCESS AND APPARATUS FOR USE THEREIN

Sadao Yokoe; Seimei Abe; Shoichi Wakata; Satosi Endou, all of Yokohama, and Kazuyoshi Onozawa, Sayama, all of Japan, assignors to Trinity Industrial Corporation, Tokyo, Japan

Filed Sep. 28, 1982, Ser. No. 426,091
Claims priority, application Japan, Oct. 16, 1981, 56-164276
Int. Cl.³ B05B *5/00*
U.S. Cl. 239—703 **3 Claims**

1. In a high-velocity rotating atomizing device for electrostatic coating, said device comprising a circumferential edge for atomizing and discharging a liquid paint, an inner circumferential surface for guiding the paint in thin film form to the circumferential edge, an annular paint reservoir for storing the paint and an annular paint flow passage connecting the annular paint reservoir to the inner circumferential surface; the improvement wherein the circumferential edge has a number of cuts regularly arranged radially at small intervals and comprised of alternating ridges and valleys, wherein the valleys of the cuts are each located within a plane substantially at right angles to the axis of the rotating member, the inner circumferential surface forms a smooth introducing surface inwardly of the valleys of the cuts, and the introducing surface approaches the valleys of the cuts at an inclination angle of within ±15° to



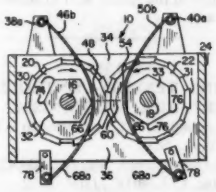
the axial direction and wherein knurled grooves are formed on the entire outer circumferential surface of the annular paint flow passage, the knurled grooves having a pitch of 0.1 to 3 mm and a depth of 0.1 to 3 mm.

4,519,550

MATERIAL GUIDE AND CLEANER FOR COMMINUTING APPARATUS

Michael W. Rouse, West Linn, Oreg., assignor to Waste Recovery, Inc., Dallas, Tex.

Continuation of Ser. No. 356,317, Mar. 9, 1982, abandoned. This application Jun. 29, 1984, Ser. No. 625,587
Int. Cl.³ B02L *7/04*
U.S. Cl. 241—167 **7 Claims**



1. Apparatus for comminuting waste materials, comprising:

(a) a pair of rotatable rolls having parallel central axes of rotation, said pair of rolls having an infeed side and an outlet side, each roll having a central shaft and a plurality of cutter discs mounted on said shaft and axially spaced apart therealong, defining a plurality of spaces between the cutter discs of each of said rolls, the respective cutter discs of each roll of said pair extending into respective ones of said spaces defined between the cutter discs of the other of said pair of rolls;

(b) a plurality of elongate guide-clearer fingers associated with each of said rolls, each said guide-clearer finger extending through a respective one of said spaces defined between said cutter discs of a respective one of said rolls, between said central shaft of said one of said rolls and a respective cutter disc of the other of said pair of rolls, from said infeed side toward said outlet side; and

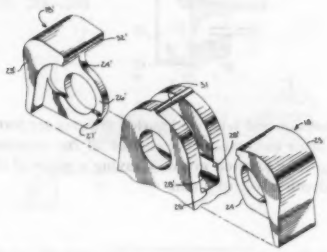
(c) a plurality of cams located respectively on said rolls, between said cutter discs, said cams including lobe means for periodically moving said guide-clearer fingers radially with respect to said rolls to help feed material to be comminuted from said infeed side into an area wherein said cutter discs of one roll extend into said spaces between said cutter discs of the other roll, while clearing communiuted material from between said cutter discs.

4,519,551

REPLACEABLE PROTECTIVE CAPS FOR SPIDER ARMS OF A REVERSIBLE HAMMER MILL

Kenneth Ceurvorst, LeClaire, Iowa, assignor to Sivyer Steel Corporation, Bettendorf, Iowa

Filed Jun. 7, 1983, Ser. No. 501,839
Int. Cl.³ B02C *13/26*
U.S. Cl. 241—194 **3 Claims**



1. For use in a reversible hammer mill including a rotor with a spider arm, replaceable cap members for protecting the tip of a spider arm comprising:

(a) a pair of cap members;

(b) each cap member defining a body having an outer protective shroud for protecting a portion of said tip of said spider arm; and

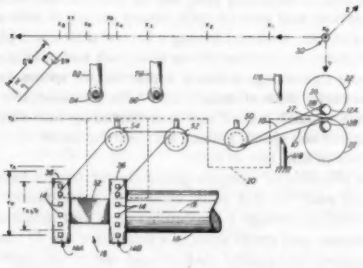
(c) a relatively narrow web projecting inwardly from an interface of the shroud of each said cap, each said web sized to interfit with each other in an opposing manner within an open-ended slot in the spider arm; each said web including a pin receiving opening for cooperating with aligned openings in the spider arm to secure each said cap to the spider arm.

4,519,552

WIRE ROUTING, TENSION-CONTROLLING AND BREAKING MECHANISM

John G. Tucker, Lexington, N.C., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,435
Int. Cl.³ H01F *11/04, 5/02*
U.S. Cl. 242—7.17 **13 Claims**



1. An apparatus for routing and controlling the tension in a wire extending from a distant point to a terminal pin on a bobbin, which comprises:

means for securing a trailing portion of the wire to hold the trailing portion at the distant point while leading portions of the wire are being routed toward the terminal pin;

first routing and tension-controlling means, stationary with respect to the securing means, for decoupling from one portion of the wire at least a portion of a tensile stress applied to another portion of the wire and for routing a first intermediate portion of the wire in a direction generally toward the terminal pin;

second routing and tension-controlling means, stationary with respect to the securing means, for decoupling from said one portion of the wire at least another portion of a tensile stress applied to said other portion of the wire and for routing a second intermediate portion of the wire directly toward the terminal pin; and

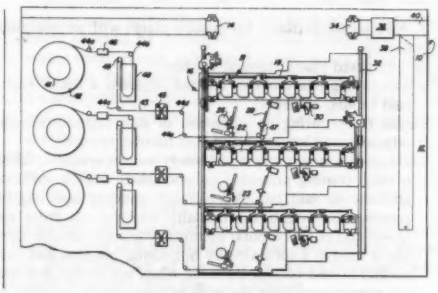
means for dispensing the trailing portion of the wire about the securing means for attachment thereto, the intermediate portions of the wire about at least portions of the first and second routing and tension-controlling means and a leading portion of the wire to a position adjacent and about the terminal pin for attachment thereto, whereby the first and second routing and tension-controlling means share in resisting the tensile stress in the wire between the securing means and the terminal pin.

4,519,553

MULTIPLE SPINDLE WINDING APPARATUS

Jesse L. Campbell; Alan A. Fennema; Robert B. Henderson, all of Tucson, Ariz.; William G. Rance, Jr., West Palm Beach, Fla.; Paul H. Whittington, and William O. Wightman, Jr., both of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 2, 1984, Ser. No. 626,948
Int. Cl.³ B31F *5/04;* **B65C** *3/12;* **B65H** *19/28*
U.S. Cl. 242—56 R **10 Claims**



1. A winding apparatus for winding media successively upon a plurality of reels, each contained within a cartridge, comprising;

means for supplying cartridge in seriatim fashion through a series of in-line operating stations;

means for continuously supplying media to one of said stations for winding upon the reel;

extension means at an adhesive station for reaching through an opening in a cartridge positioned proximate thereto for applying an individual adhesive patch to the hub of the reel within the cartridge;

vacuum means at an attach station for bringing a leading section of the media into the cartridge positioned therein and pressing it to said adhesive patch, thereby attaching the media to the reel;

means for winding media upon the reel to one of a predetermine category of sizes;

means for severing the media from the wound reel, while maintaining control of the supply end for feeding the next cartridge; and

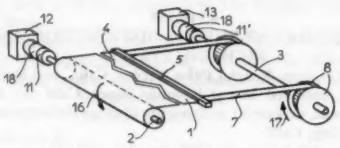
means at a following station for fastening a leader block to the trailing ends of the media associated with each wound reel.

4,519,554

DEVICE FOR DRIVING A PROTECTION AWNING

Jacques Dussoliet, Cluses, and Michel Dieupart, Sallanches, both of France, assignors to Somfy, France

Filed Apr. 13, 1984, Ser. No. 600,128
Claims priority, application France, May 19, 1983, 83 08285
Int. Cl.³ B65H *17/02*
U.S. Cl. 242—67.4 **5 Claims**



1. A device for driving a protection awning adapted to be at least partially spread horizontally, having one end attached to a first winding shaft and the other free end connected through at least one flexible strap to a second winding shaft, each winding shaft being coupled angularly to rotary driving means, one of said rotary driving means being adapted to rotate in one direction permitting the winding up of the awning on said first winding shaft while unwinding said flexible strap from the other winding shaft, the other rotary driving means being adapted to rotate in one direction permitting of winding up said flexible strap on said second winding shaft while unrolling simultaneously said awning from the other winding shaft, wherein there is provided for each winding shaft eddy-current type rotation retarding means cooperating with a single unidirectional driving device, each said unidirectional devices being disposed between on the one hand a rotary nember forming part of a kinematic assembly connecting each rotary driving means to the corresponding winding shaft, and on the other hand a fixed support located in close vicinity of said rotary member, a rotary movable element common to both devices, coaxial to said rotary member, supporting one section of each one of said two devices and adapted to cooperate with another section of each device which is rigid the one with said rotary member and the other with said fixed support, each unidirectional driving device being so oriented as to provide the angular coupling between its two sections only when the corresponding winding shaft is being driven for rotation, through said awning and said flexible strap, from said means for rotatably driving said other winding shaft.

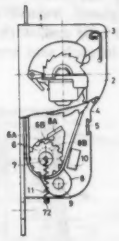
4,519,555

WEBBING LOCKING DEVICE FOR THE SEAT BELT OF AN AUTOMOTIVE VEHICLE

Masahiro Tukamoto, Fujisawa, Japan, assignor to Nippon Seiko Kabushiki Kaisha, Tokyo, Japan

Filed May 4, 1982, Ser. No. 374,778
Claims priority, application Japan, May 7, 1981, 56-69192
Int. Cl.³ A62B *35/02;* B65H *75/48*
U.S. Cl. 242—107.2 **8 Claims**

1. A webbing device for the seat belt of a vehicle, comprising a retractor mounted on a base for receiving the webbing of the seat belt and including a webbing take-up reel, a speed change detector associated with said base, means including a brake responsive to said speed change detector for holding the reel upon a sudden change in the movement of the vehicle, a rotor having an outer peripheral surface for receiving the webbing partially therearound, rotor arms for supporting said rotor, means on said arms for supporting said rotor for movement relative said arms, means mounting said arms pivotally relative said base, and means including longitudinal latch teeth extending axially around said outer peripheral surface of said rotor and adapted to mesh with portions of said arms extending



parallel thereto upon tension being created in said webbing during holding of the reel for preventing rotation of said rotor.

4,519,556

UNIVERSAL CABLE WINDING DRUM

Walter Timoschuk, 19 Place de Bohéme, Candiac, Quebec, Canada J5R 3N2

Filed Jul. 19, 1984, Ser. No. 632,430
Claims priority, application Canada, Jun. 19, 1984, 456935
Int. Cl.³ B66D *1/36*
U.S. Cl. 242—117 **9 Claims**

1. A universal cable winding drum for winding and unwinding a cable connected thereto, said drum having a hollow central hub for securement to a rod associated with winding means to impart rotation to said drum, and a cylindrical cable supporting wall connected to said hub and extending thereabout for supporting a plurality of windings of a cable thereon, said cable supporting wall having a plurality of cable guide channels formed therein in side-by-side relationship, said channels defining valleys and side peaks, said valleys diminishing in depth from diametrically opposed points on respective opposed half-sections of said drum to an intermediate mid-area on diametrically opposed sides of said cable supporting wall where said peaks of said channels of one of said half-sections are interspaced and overlap in length with said peaks of said other half-section and taper within said drum cable supporting wall surface, said channels constituting right and left hand cable guide channels, and means to secure an end of said cable to said drum,.

4,519,557

PLASTIC BOBBIN

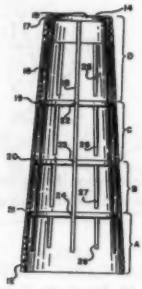
Arnold Newman, 4170 Cove La., Glenview, Ill. 60025

Filed Nov. 26, 1982, Ser. No. 444,618
Int. Cl.³ B65H *75/10, 75/20*
U.S. Cl. 242—118.31 **13 Claims**

11. A bobbin construction, said bobbin of the type having a configuration of a one-piece hollow cone having a central axis, sid cone molded of plastic, said cone having a tip end and a

base end, a thin-walled sheath having an inner surface and an outer surface, and an inner skeletal frame of longitudinally-spaced circumferential ribs and circumferentially-spaced longitudinal ribs supporting said sheath, said bobbin comprising:

a plurality of contiguous, frusto-conical segments and extending from said base end, with a portion of said inner surface included in each said segment inclined with respect to said outer surface to form sheath segments of varying thickness;



a plurality of partial ribs in each segment and having a substantially constant thickness with respect to said outer surface, thereby defining tapered partial ribs in each segment; and,

said outer surface formed at a constant taper with respect to said axis.

4,519,558

TAPE PLAYER

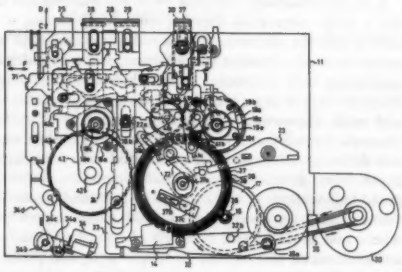
Hideo Yokoyama, Yokohama; Seiji Tomita, Yokosuka, and Shigeo Yamada, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 27, 1983, Ser. No. 546,120

Claims priority, application Japan, Nov. 19, 1982, 57-202953

Int. Cl.[3] G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—186 **17 Claims**



1. A tape player having operating modes including normal speed and high speed and being connected to driving means, comprising:

a. a chassis;

b. a spindle mounted on said chassis;

c. a drive body rotatably mounted on said spindle, said drive body being responsive to said driving means and rotating continuously regardless of the operating mode of said tape player;

d. a fast speed body and a normal speed body both rotatably mounted on said spindle to rotate in a given direction together with said drive body;

e. first and second reels used, respectively, for take-up and supply of the tape;

f. fast speed transmission means for transmitting the rotation of said fast speed body to said first reel for take-up of the tape during high-speed running of the tape player; and

g. normal speed transmission means for transmitting the rotation of said normal speed body to said first reel for take-up of the tape during normal speed running of the tape player.

4,519,559

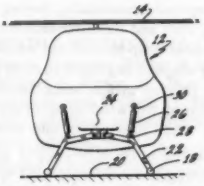
LANDING GEAR ENERGY DISTRIBUTION AND RIGHTING SYSTEM

Andrew H. Logan, Rancho Palos Verdes, Calif., and Robert A. Wagner, deceased, late of Redondo Beach, Calif. (by Jeanne M. Roireau, executrix), assignors to Hughes Helicopters, Inc., Culver City, Calif.

Filed Dec. 26, 1979, Ser. No. 107,144

Int. Cl.[3] B64C *25/58*

U.S. Cl. 244—17.17 **13 Claims**



1. A landing apparatus for use in an aircraft to reduce angular motions of the aircraft in a non-level landing and to restore the aircraft to an equilibrium attitude with respect to the ground following such a landing, comprising:

an aft landing strut coupled to said aircraft;

a forward landing strut couple to said aircraft;

an aft damper coupled to said aft landing strut;

a forward damper coupled to said forward landing strut;

a restoring piston hydraulically coupled to said aft and forward dampers, compression of one of said forward and aft dampers forcing hydraulic fluid into said restoring piston and said restoring piston in response forcing hydraulic fluid into the other one of said aft and forward dampers, said restoring piston having a preferred configuration wherein hydraulic fluid is evenly distributed by said restoring device between said aft and forward dampers to restore said aircraft to said equilibrium attitude;

an aft surge reservoir hydraulically coupled to said aft damper and to said restoring piston to limit the magnitude of the hydraulic pressure communicated therebetween; and

a forward surge reservoir hydraulically coupled to said forward damper and to said restoring piston to limit the magnitude of pressure of said hydraulic fluid communicated therebetween.

10. A method for use on an aircraft to reduce angular motions of the aircraft in a non-level landing and to restore the aircraft to an equilibrium attitude with respect to ground following such a landing, comprising the steps of:

contacting said ground with a first landing strut;

compressing a first damper coupled to said first landing strut;

communicating said hydraulic fluid from said first damper to a restoring means;

communicating hydraulic fluid from said restoring means to a second damper;

expanding said second damper to extend a second landing strut coupled thereto;

contacting said ground with said second landing strut to reduce angular motion of said aircraft in said non-level landing; and

limiting the pressure of hydraulic fluid being communicated between said first and second dampers through said restoring means, said pressure being limited by surge means hydraulically communicating with said first and second dampers and said restoring means.

4,519,560

AIRFOIL FOR CONTROLLING REFUELING BOOM

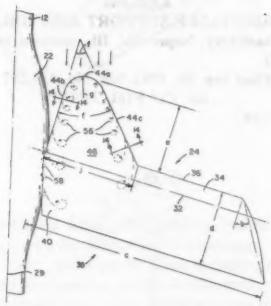
Kichio K. Ishimitsu, Mercer Island, and Edward N. Tinoco, Bellevue, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 840,589, Oct. 11, 1977, Pat. No. 4,231,536. This application Nov. 3, 1980, Ser. No. 203,452

The portion of the term of this patent subsequent to Nov. 4, 1997, has been disclaimed.

Int. Cl.³ B64C *3/10*

U.S. Cl. 244—45 R **24 Claims**



1. An airfoil assembly, comprising:

a. a body member,

b. a pair of airfoils on opposite sides of said body member, each airfoil having a spanwise axis and a chordwise axis, each airfoil comprising:

1. a first section at a first outboard spanwise location, having an airfoil configuration with a leading edge shaped to cause attached flow over said first section to create a lifting force caused by airflow over said first section;

2. a second section at a second inboard spanwise location, having an airfoil configuration to create a lifting force caused by airflow over said second section;

3. said second section having a forwardly extending strake-like member mounted to a forward portion of the second section at a location proximate said body, and having spanwise and chordwise axes generally aligned with the axes of the airfoil;

4. said strake-like member having a leading edge comprising:

(i) a first forward edge portion;

(ii) a second lateral edge portion extending from the forward edge portion to the leading edge of the first section, said second lateral edge portion having a sufficiently small cross-sectional radius of curvature and having a sweep angle sufficient to create a single discrete vortex of air passing over said second lateral edge portion, through a range from a very low angle of attack to a very high angle of attack;

(iii) a third lateral edge portion extending rearwardly from the first forward edge portion proximate said body member, said third lateral edge portion having a sufficiently small cross-sectional radius of curvature and having a sweep angle sufficient to create a single discrete vortex of air passing adjacent said body member and over said third lateral edge portion, through a range from a very low angle of attack to a very high angle of attack.

4,519,561

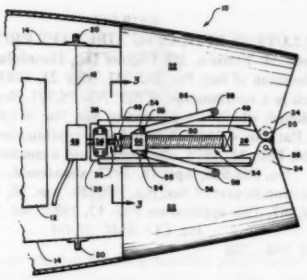
AIRCRAFT THRUST REVERSER MECHANISM

Richard H. Timms, San Diego County, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed May 23, 1983, Ser. No. 497,249

Int. Cl.³ F02K *1/00*

U.S. Cl. 244—110 B **7 Claims**



1. A thrust reverser nozzle through which a fluid stream is discharged as a jet, thrust reversal means surrounding said nozzle, a drive means comprising nested inner and outer jackscrews, said inner jackscrew is non-translatable and said outer jackscrew is translatable relative thereto, said inner jackscrew is rotated by a jackscrew drive motor and said outer jackscrew is inter-connected to said inner jackscrew for rotation therewith by a slidable mechanical connection therebetween, whereby said thrust reversal means moves rearwardly as a unit at a first speed of translation while moving said thrust reversal means into a position to reverse the flow of gas as it leaves the nozzle at a second speed of translation which is slower than said first speed of translation.

4,519,562

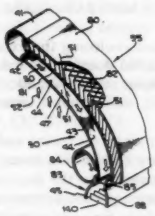
AIRCRAFT

William M. Willis, 19440 Citronia St., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 287,229, Jul. 27, 1981, abandoned. This application Dec. 2, 1982, Ser. No. 446,279

Int. Cl.³ B64C *21/04*

U.S. Cl. 244—207 **38 Claims**



1. The method of creating a vertical lifting force on a lifting element which smoothly curves outwardly from horizontal to vertical comprising the steps of:

(a) flowing primary fluid in a thin sheet from a pneumatic plenum via a rectangular nozzle extending substantially the full length of the lifting element to cause said sheet to flow across the upper surface of the element from the horizontal side to the vertical side opposite thereof;

(b) divergently bounding said flowing primary fluid adjacent the entire length of the upper surface of the element from the horizontal to vertical by a porous surface which

smoothly curves in generally like manner but slightly divergently; and

(c) continuously adding sufficient augmenting fluid to said flowing primary fluid through the porous surface to maintain the combined flowing fluid stream in laminar flow adjacent the upper surface of the element whereby a differential pressure is created across the element tending to lift it vertically.

4,519,563

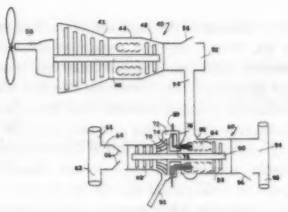
POLLUTION REDUCING AIRCRAFT PROPULSION

Raymond M. Tamura, 218 Lagoon Dr., Honolulu, Hi. 96819

Continuation of Ser. No. 265,732, May 21, 1981, abandoned, which is a continuation of Ser. No. 76,701, Sep. 18, 1979, abandoned, which is a division of Ser. No. 961,061, Nov. 15, 1978, Pat. No. 4,214,722, which is a continuation of Ser. No. 532,646, Dec. 13, 1974, abandoned, and a continuation of Ser. No. 788,526, Apr. 18, 1977, abandoned, and a continuation-in-part of Ser. No. 788,528, Apr. 18, 1977, Pat. No. 4,169,567. This application Feb. 17, 1983, Ser. No. 467,424

Int. Cl.³ B64C *21/04*

U.S. Cl. 244—208 **7 Claims**



1. Pollution reducing aircraft propulsion system apparatus comprising:

an aircraft with a fuselage and airfoil surfaces comprising forward upper airfoil surfaces with air suction ducts and remaining airfoil surfaces containing blower ducts,

a primary propulsion engine mounted on the aircraft, said primary propulsion engine comprising a compressor stage for forcing air into a burner stage, a burner stage for producing combustion products, a turbine stage driven by the combustion products, a shaft driven by the turbine stage, and propeller means driven by the shaft,

fuel and air inputs and a main exhaust outlet connected to the engine for feeding fuel and air into the engine and exhausting normally wasted combustion products from the engine,

collecting means enclosing the exhaust outlet for collecting normally wasted combustion exhaust matter therefrom,

an auxiliary engine comprising secondary combustion means for receiving said exhaust matter from said collection means,

boundary layer air intake means and fuel means connected to the secondary combustion means for adding combustion sustaining material to the secondary combustion means, said boundary layer intake means being connected to the air suction ducts for receiving air therefrom,

combustion initiating and maintaining means in the secondary combustion means for initiating and maintaining combustion therein,

secondary exhaust means connected to the secondary combustion means and the blower ducts for conducting exhaust from the secondary combustion means to the blower ducts,

turbine means connected to the secondary exhaust means and being operatively driven by exhaust passing through the secondary exhaust means,

blower means operatively connected to the turbine means and connected to the boundary layer air intake means,

conduit means connected to the blower means for conducting compressed air away from the blower means, and

distribution means connected to the conduit means and the blower ducts for distributing air from the blower and conduit means over airfoil surfaces of the aircraft, said collecting means comprising an exhaust plenum chamber formed by a closed chamber connected to the main exhaust outlet being vented out by an over pressure relief valve and conduit means for communicating exhaust matter from the plenum chamber into the secondary combustion means.

4,519,564

ADJUSTABLE SUPPORT ASSEMBLY

Rudolph E. Nadherny, Naperville, Ill., assignor to Ireco, Inc., Chicago, Ill.

Filed Sep. 30, 1982, Ser. No. 429,252

Int. Cl.³ F16L *3/00*

U.S. Cl. 248—58 **29 Claims**

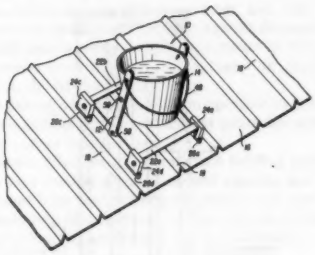
1. An adjustable support assembly comprising a plurality of inelastic, flexible and stiff cables and a plurality of retaining members spaced along and rigidly secured to said stiff cables, said cables and said retaining members forming, in combination, a series of stiff elongated eyes, said stiff cables of the elongated eyes being sufficiently resilient in their generally transverse dimension such that said elongated eyes will expand and snap back to a generally closed position, said stiff cables of the elongated eyes being biased toward a generally closed orientation to provide a wedging portion at which at least a section of each of said stiff cables is substantially juxtaposed with respect to the other, at least one of said inelastic, flexible and stiff cables extends beyond an outermost retaining member, said at least one cable having a free end, said free end includes one-way means, said one-way means having a leading end and a trailing end, said elongated eye and its wedging portion being sized and structured to permit passage of said one-way means through said elongated eye, said trailing end of the one-way means having an integral stop that is sized to provide a rigid abutment between said elongated eye and said trailing end of the one-way means, and said abutment restrains passage of the one-way means in a direction toward said abutment between the elongated eye and the integral stop.

4,519,565

PAINT-BUCKET HOLDER

Richard L. Whitmore, Rte. 1, Box 292, Kenbridge, Va. 23944

Filed Nov. 22, 1982, Ser. No. 443,824
Int. Cl.³ A47G *29/02*
U.S. Cl. 248—237 **9 Claims**



1. A paint-bucket holder for painting inclined surfaces of housings made of a ferric material comprising:

a support frame, said support frame including a rectangularly-shaped base portion, which is sufficiently narrow that it can fit between standing seams of most tin roofs, said base portion forming four mounting areas approximately at the laterally-displaced corners of the rectangle thereby defining a mounting plane for supporting said frame on a facing of a ferric-material housing being painted, said support frame further including an upright portion rigidly attached to said base portion and extending laterally from said mounting plane, said upright portion having at a position opposite said mounting plane, approximately half way between lines respectively connecting said first and second adjacent mounting areas and said second and third mounting areas, two spaced swivel bucket attachment means for coupling said upright portion to opposite sides of the upper portion of a paint bucket thereby allowing the bucket to swivel so that when the paint bucket holder is placed on an inclined surface with said first and second mounting means being uphill and said third and fourth mounting means being downhill its bottom swings perpendicularly away from said line connecting said first and second mounting areas perpendicularly toward said line connecting said third and fourth mounting areas and said bucket thereby remains upright for various positions of the support frame; and,

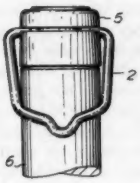
at least two magnetic foot assemblies one being attached to said base portion at said first corner mounting area and the other being attached to said base portion at said second corner mounting area and each including a loosely held permanent magnet for contacting said facing of said ferric material housing and attaching thereto by means of magnetic attraction, said mounting areas being positioned sufficiently far apart such that when said mounting plane is arranged horizontally the magnetic foot assemblies lie far outside of a vertically-projected perimeter of the upright paint bucket with the bucket being approximately equidistant from said line connecting said first and second mounting areas and said line connecting said third and fourth monitoring areas.

4,519,566

HANGER DEVICE FOR LONG HANDLED IMPLEMENTS

Joseph Manzi, Bronx, N.Y., assignor to Gossling Development Corporation, Bronx, N.Y.

Continuation of Ser. No. 428,279, Sep. 29, 1982, abandoned. This application Oct. 3, 1983, Ser. No. 538,534
Int. Cl.³ A47B *91/00*
U.S. Cl. 248—360 **1 Claim**



1. In a hanger device for long-handled implements, a first part of molded material having a bottom surface adapted to conform to the rounded end of implement handles and provided with a peripheral recessed area adapted to receive a rotating part and secured to a handle end by means of a screw, a second part of like manufacture rotatable around and below the cap portion of the secured part conforming to the round dimension of said part and the spherically shaped end of the top end of the implement handle, said second part being loosely held to allow rotation and having a groove traversing the upper surface thereof and a bail hanger conforming to and engaging upon the round shaft of a handle when the bail is in the lower position and having an outwardly projecting portion positioned at the apex to facilitate removal from engagement upon a handle and when upright to facilitate engagement upon a hook, said bail having portions at each end adapted to pivotally engage the groove of the rotating part, whereby the uppermost portions of the bail ends are always in contact with the rotating part and slidably engages the underside of the cap portion of the first part, a spring which seats within a circumferential depression of the rotating part, abuting the implement handle end providing an upward thrust to the rotating part which pressure maintains the bail in firm contact with the first part and the second part.

4,519,567

MOLD FOR MANUFACTURING AN ANNULAR OBJECT OF ELASTIC MATERIAL

Karl Rautenberg, Hyltebruk, Sweden, assignor to Forsheda AB, Forsheda, Sweden

Continuation of Ser. No. 432,763, Oct. 4, 1982, abandoned. This application Feb. 16, 1984, Ser. No. 580,931
Claims priority, application Sweden, Feb. 10, 1982, 8105825
Int. Cl.³ B29B *1/14*
U.S. Cl. 249—57 **9 Claims**

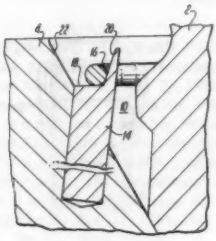
1. A mold having a cavity for manufacturing an annular object of elastic material with an annular reinforcing element embedded therein, wherein the reinforcing element is positioned in the cavity before the elastic material is injected into the cavity, comprising:

a plurality of pins supported by the mold and projecting into the cavity;

a support surface on each pin extending in a common plane for supporting the reinforcing element in position in the cavity;

a guiding surface on each pin extending in a common truncated conical surface intersecting said common plane, the diameter of said truncated conical surface decreasing in the direction away from said common plane of said support surfaces and being substantially equal to the inner diameter of the reinforcing element at a plane passing

through said truncated conical surface and extending in parallel adjacent spaced relationship with respect to said common plane of said support surfaces, so that said guiding surfaces guide the reinforcing element into correct position and retain the reinforcing element in correct position on said support surfaces when introduced into the mold; and



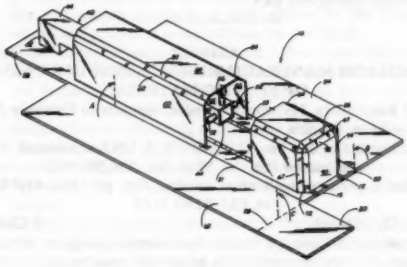
a sprue for injection of elastic material extending through said mold and communicating with said cavity at a position substantially opposite to the plane of said supporting surfaces so that material injected through said sprue will act on the reinforcing element to retain it against said support and guiding surfaces.

4,519,568

APPARATUS FOR CONSTRUCTING MODULAR PRE-CAST CONCRETE BUILDINGS

James D. Day, and James D. Day, II, both of 5001 S. Claiborne, New Orleans, La. 70125

Filed May 31, 1983, Ser. No. 499,650
Int. Cl.³ B28B 7/10
U.S. Cl. 249—66 R **18 Claims**



1. An apparatus for constructing a modular, pre-cast concrete building comprising:

(a) outer and inner forms providing a mold for said building, said outer form being collapsible from its mold forming position and said inner form being retractable from its mold forming position;

(b) means for extruding said inner form from said mold;

(c) support means slidably engaging said building and said outer form for slidably supporting said building on said outer form; and

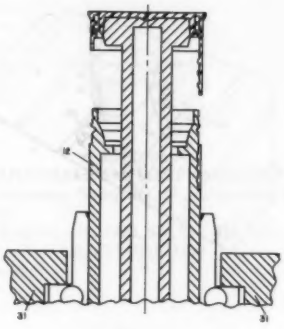
(d) means attached to said building for slidably removing said building from said outer and inner forms.

4,519,569

MOLDING

Robert L. Nolan, New York, N.Y., assignor to Maxcap, Inc., New York, N.Y.

Filed Apr. 5, 1984, Ser. No. 597,189
Int. Cl.³ B29F 1/14
U.S. Cl. 249—142 **10 Claims**



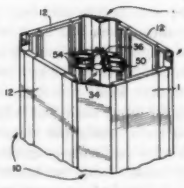
1. A mold for forming a plastic cap having a top and side wall comprising a core against which the inside of said cap is formed, mold means against which the outside of the top of said cap is formed and a sleeve surrounding said core and against which the outside of the side wall of the cap is formed said sleeve being in close contact with said core at the boundary of the zone where the bottom of said cap side wall is formed, said contact being sufficiently close to substantially prevent flow of plastic between said core and said sleeve at said boundary, said mold having means for effecting axial movement of said core relative to said sleeve on completion of the molding of a cap so as to remove the resulting molded cap from within said sleeve, the improvement wherein said sleeve comprises at least two separable portions each in close contact with said core along said boundary, means for maintaining said portions in said close contact with each other during the molding of said cap, the construction and arrangement being such that said portions are permitted to move away from each other and from said core at the beginning of said axial movement of said core.

4,519,570

INSIDE CORNER CONCRETE FORM UNIT

James K. Strickland, and H. Grady Ivey, both of Jacksonville, Fla., assignors to Strickland Systems, Inc., Jacksonville, Fla.

Filed Sep. 22, 1983, Ser. No. 534,682
Int. Cl.³ B28B 7/30
U.S. Cl. 249—194 **7 Claims**



1. A concrete form unit for inside corner casting comprises:

a pair of form panels disposed generally perpendicular to each other;

an elongated corner member disposed generally between adjoining edges of said panels;

actuator means having relatively moveable first and second parts interconnecting said panels and said corner member, said second part being connected to move said corner member;

parallelogram linkage means connecting each of said form panels to said first part of said actuator, said linkage means having respective collapsed and expanded conditions;

holding means having a retaining condition operable to cooperate between said corner member and said form panels to retain said corner member against displacement toward said panels while said linkage means is shifted to said expanded condition by said actuator to strip said panels from the hardened concrete;

latch means having a holding condition operable to hold said form panels against relative movement while said actuator strips said corner member; and

operating means effective to operate said holding means to and from said retaining condition and operate said latch means to and from said holding condition, said operating means including an operator connected to conjointly operate said holding means and said latch means.

4,519,571

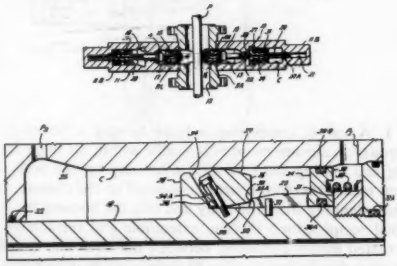
FLUID OPERATED, AXIALLY RECIPROCATING ACTUATOR

Marvin R. Jones, and Roland M. Howard, Jr., both of Houston, Tex., assignors to Koomey Blowout Preventers, Inc., Houston, Tex.

Continuation of Ser. No. 461,761, Jan. 31, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,572

Int. Cl.³ E21B *33/06*

U.S. Cl. 251—1 A **32 Claims**



22. A blowout preventer, comprising a housing having a bore therethrough and chambers therein intersecting opposite sides of the bore, a ram within each chamber, and an actuator for moving each ram between an outer position to open the bore and an inner position for engaging the other ram to close the bore, each actuator comprising a cylinder with a conical locking shoulder extending radially outwardly from its inner diameter and in an axial direction toward the inner end of the cylinder, a rod connected to a ram and extending sealably through the inner end of the cylinder for axial reciprocation between an inner position to close the bore and an outer position to open the bore, piston means axially reciprocable within the cylinder, means by which operating fluid may be supplied to or exhausted from opposite sides of the piston means, locking elements carried about the rod for radial expansion and contraction between inner positions in which they are free to move within the inner diameter of the cylinder and outer positions in which conical surfaces on their outer sides which are substantially complementary to the conical shoulder of the cylinder project outwardly from said diameter, means for transmitting to the rod via the locking elements a relatively large axial component of the axially inwardly directed force due to operating fluid supplied to the outer side of the piston means in order to move the rod axially inwardly with the locking elements until the conical surfaces of the locking elements are radially opposite the cylinder shoulder, and then transmitting to the rod via the locking elements a relatively large radial component of such force in order to cause the locking elements to move radially outwardly with respect to the rod and the conical surfaces thereof to slide radially outwardly and axially along the inwardly cylinder shoulder as the rod continues to move axially inwardly with the locking elements to its inner position, said rod being locked against return movement from its inner to its outer position, upon exhaustion of operating fluid from said outer side of the piston means, and means for transmitting to the rod the axially outwardly directed force due to the supply of operating fluid to the inner side of said piston means and to cause the locking elements to slide radially inwardly along the shoulder and then axially outwardly with the rod as the rod is returned to its outer position.

4,519,572

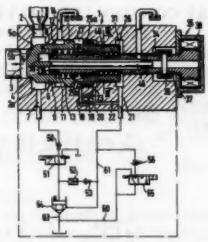
VALVE DEVICE, ESPECIALLY FOR DIE CASTING MACHINES

Hans-Jürgen Müller, and Hans-Gebhard Krines, both of Usingen, Fed. Rep. of Germany, assignors to Vickers, Incorporated, Troy, Mich.

Filed Aug. 18, 1982, Ser. No. 409,163

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—29 **14 Claims**



1. Valve arrangement, especially for pressure die casting machines, with the following features:

arranged in a valve housing is a main valve with a valve cone, a control piston and a stroke-limiting stop;

the stroke-limiting stop can be adjusted by means of a drive mechanism, which comprises a threaded bushing and a support thread arranged on the valve housing;

a control valve device, which also contains throttle devices, is connected by at least one control line to the main valve, so that the valve cone of the latter can execute a delayed or a quick movement;

characterized in that the threaded bushing has pressurized surfaces, on which counteracting displacement forces, in the support direction or in the release direction, develop onto the threaded bushing, the relative size of said displacement forces to one another changing with every switching cycle of the valve cone.

4,519,573
DEVICE FOR THE ACTUATION OF A SLIDE VALVE

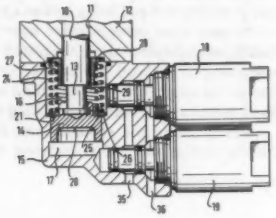
Reiner Bartholomäus, Neuendorf, Fed. Rep. of Germany, and Michel Rivolier, Bron, France, assignors to Mannesmann Rexroth GmbH, Fed. Rep. of Germany

Filed Apr. 1, 1983, Ser. No. 481,316

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214845

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—30 **9 Claims**



1. A device for positioning a slide valve displaceable in a bore of a housing and subject to the force of a restoring spring, in particular for actuation of the piston of a switching valve, the device comprising a first regulator, a second regulator and a regulating piston fixed to the slide valve and having a circular face directed away from the slide valve and acted upon by pressure from the first regulator, and an annular face directed towards the slide valve and acted upon by pressure from the second regulator, and an equaliser spring acting on the annular face of the regulating piston to equalise the unequal controlling forces acting on the different sized annular and circular faces of the regulating piston, said equaliser spring being mounted with one end engaging part of the housing and the other end engaging a spring abutment which is urged against the regulating piston and against a ledge on the housing.

4,519,574
AUXILIARY CONTROLLED VALVE DISPOSED IN A DRILLING STRING

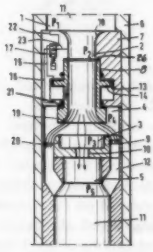
Rudolf Röper, Dortmund, Fed. Rep. of Germany, assignor to Norton Christensen, Inc., Salt Lake City, Utah

Filed Aug. 1, 1983, Ser. No. 519,422

Claims priority, application Fed. Rep. of Germany, Sep. 14, 1982, 3233982

Int. Cl.³ F16K *31/12*

U.S. Cl. 251—31 **13 Claims**



1. An auxiliary controlled valve disposed in a drilling string to produce pressure pulses in a flushing pressure fluid flowing downwards under pressure through a central passage of the string, the valve, a drill bit and upwards through an annular chamber, wherein the valve comprises: a main throttle section, a low-resistance transmission section including a chamber of constant cross section adjacent and connected in parallel to the main throttle section, a valve seat between the main throttle and low-resistance transmission sections, a longitudinally movable valve body adjacent to and displaceable downwardly against the valve seat to close off the low resistance transmission section, a piston guidedly mounted in a pressure chamber and connected to displace the valve body and be displaced by the pressure fluid in the central passage; and an auxiliary throttle section adjacent an inlet end of the valve adapted to obtain a pressure difference in the pressure fluid for actuating and displacing the piston and valve body, and wherein the auxiliary throttle section, the valve body, and the main throttle section each have a rectilinear passage about a common axis, the valve body and valve seat have surface means adjacent one another that form a continuous course so as to maintain a boundary layer of flow next to said surface means for ensuring a flow substantially free of flow separation and reduced valve flutter, and the valve body has compensating means responsive to the pressure of the fluid in the central passage and low resistance transmission section to compensate for dynamic flow forces.

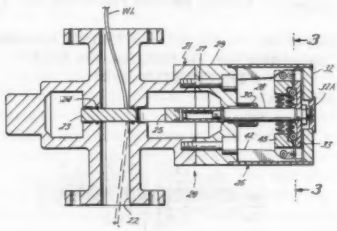
4,519,575
VALVES AND VALVE ACTUATORS

Neil H. Akkerman, and Daniel O. Dewey, both of Houston, Tex., assignors to Ava International Corporation, Houston, Tex.

Filed Apr. 20, 1984, Ser. No. 602,511

Int. Cl.³ F16K *31/00*

U.S. Cl. 251—58 **15 Claims**



1. A valve, comprising a body having a flowway therethrough, a closure member movable within the body for opening and closing the flowway, a housing on the body having cam means thereon, a stem connected to the closure member and extending from the body and into the housing for longitudinal reciprocation therein, extendible and retractable, fluid-actuated means extending between the stem and housing for moving the closure member to open position in response to the supply of operating fluid thereto, and means for moving the closure member to closed position in response to the exhaust of operating fluid from said fluid-operated means, including follower means reciprocable with the stem, and spring means yieldably urging the follower means into engagement with the cam means, said cam means being so arranged that the spring means moves the closure member during the end of its closing movement with a force greater than the force with which the closure member is initially moved toward closed movement.

15. A valve, comprising a body having a flowway therethrough, a closure member movable within the body for opening and closing the flowway, a housing on the body, a stem connected to the closure member and extending from the body and into the housing for longitudinal reciprocation therein, extendible and retractable, fluid-actuated means extending between the stem and housing for moving the closure member to open position in response to the supply of operating fluid thereto, and means for moving the closure member to closed position in response to the exhaust of operating fluid from said fluid-operated means, said fluid-operated means comprising cylinder means mounted on the housing, inner piston means

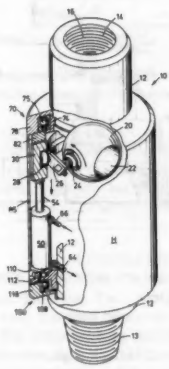
sealably slidable about the cylinder means between extended and retracted positions with respect to the cylinder means, and outer piston means mounted on the stem and sealably slidable about the inner piston means between extended and retracted positions with respect to the inner piston means, whereby operating fluid is effective over a large area as the outer piston means is first extended with respect to the cylinder means and the inner piston means, and operating fluid is then effective over a relatively small area as the inner and outer piston means are then extended with respect to the cylinder means to continue to move the closure member toward opening position.

4,519,576

OIL WELL SAFETY VALVE FOR USE WITH DRILL PIPE

Mitchell E. Winegeart, 4512 Hessmer Ave., Metairie, La. 70002

Filed Dec. 15, 1983, Ser. No. 561,647
Int. Cl.³ F16K *31/143*
U.S. Cl. 251—62 **8 Claims**



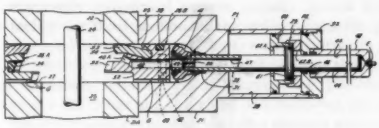
1. A drill string safety valve operator, comprising:
a. a rotatable tubular body having a longitudinal through bore for conveying fluids;
b. a valve member movably disposed within the body for valving fluid flow through the bore;
c. rotatable shaft means extending from and coupled to the valve member for moving the valve member to open or close the bore;
d. bearing means connected for rotation with the shaft means for transmitting an applied load into rotation of the shaft means;
e. upper and lower spaced apart annular surfaces positioned respectively above and below the bearing means and about the tubular body so that the respective surfaces can engage and move the bearing means in different respective directions; and
f. normally non-rotating powered means supporting the upper and lower annular surfaces in a position about the housing and respectively above and below the bearing means for powering the annular surface means to move linearly with respect to the housing and between upper and lower positions so that a respective annular surface can effect an opening or a closing of the valve member.

4,519,577

FLOW CONTROLLING APPARATUS

Marvin R. Jones, Houston, Tex., assignor to Koomey Blowout Preventers, Inc., Houston, Tex.

Division of Ser. No. 446,390, Dec. 2, 1982,. This application Jul. 25, 1984, Ser. No. 634,396
Int. Cl.³ F16K *31/122*
U.S. Cl. 251—62 **1 Claim**



1. Flow controlling apparatus, comprising a body having a flow-way therethrough, a member reciprocable within the body between first and second positions in which it restricts with the flow to greater or lesser extents, respectively, means for reciprocating the member between its first and second positions, including a cylinder outside of the body, a piston reciprocable within the cylinder, a rod on the piston extending sealably into the body for connection to the member so as to move the member to its first position as the rod is moved inwardly and to move the member to its second position as the rod is moved outwardly, and another rod on the piston extending sealably into a chamber outwardly of the cylinder, a hole extending through the piston and both of the rods to connect the inside of the body with said chamber, a plug slidably mounted within the hole for reciprocation between inner and outer limited positions, and a fitting for injecting grease into said chamber and the hole outwardly of the plug, the volume displaced by the plug in moving between its inner and outer limited positions substantially equaling that displaced by the other rod upon movement within said chamber, and said plug having restricted port means therethrough to permit grease to bypass the plug when the plug is in its inner position and to permit line fluid to bypass the plug when the plug is in its outer position.

4,519,578

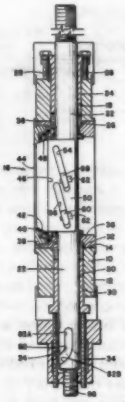
HIGH PRESSURE CAM SEAL VALVE

Paul A. Boeckman, Glenpool, and Dennis L. Young, Tulsa, both of Okla., assignors to Dover Corporation, Tulsa, Okla.

Filed Mar. 11, 1983, Ser. No. 474,504
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—163 **3 Claims**

1. A valve comprising:
a body having a flow passageway therethrough defined in part by an annular valve seat and having upper and lower stem openings therein;
a circular valve disc member positioned in said flow passageway and movable between a closed and an opened position, the valve disc having a forward surface having a peripheral sealing surface and having a rearward surface having spaced apart rearwardly extending paralleled boss portions, each boss portion being substantially the full length of a cord of the disc circular rearward surface, each boss portion having an upper and a lower slot therein, the upper slots being in a first common plane and the lower slots being in a second common plane, the first and second planes being parallel to each other and intersecting the plane of the disc sealing surface at an acute angle;
a valve stem axially positionable and rotatably positioned in said stem openings in said body, the stem being received between said disc member boss portions, said disc being thereby securely supported to the stem relative to rotational movement of said disc about its circular axis, the stem having a slot in the cylindrical surface, the slot being displaced from the plane of the stem axis;

a first and a second spaced apart paralleled pin member extending to either side of said stem and received within said disc member boss portions first and second slots respectively providing four spaced apart contact areas between said pins and said disc boss portions, the pins securely supporting said disc to said stem against displacement of the plane of said disc away from a parallel relationship with said stem;



a drive gear having an internally threaded axial opening therein, said stem member having an externally threaded portion external of said body threadably receiving said drive gear;

housing means secured to said valve body and rotatably receiving said stem member, said housing means rotatably and nonaxially displaceably supporting said drive gear;

means of rotating said drive gear; and

a guide pin extending slidably into said slot in said stem which causes said stem to rotate as it is axially displaced.

4,519,579

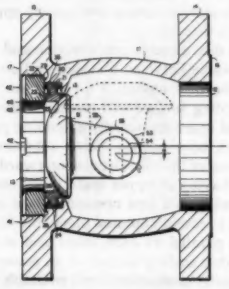
CAM VALVE SELF-CENTERING SEAT

Ronald R. Brestel, and Dale L. Meyer, both of Marshalltown, Iowa, assignors to Fisher Controls, International, Inc., Marshalltown, Iowa

Filed Feb. 14, 1983, Ser. No. 466,186

Int. Cl.³ F16K *25/00*

U.S. Cl. 251—172 **19 Claims**



1. A fluid valve comprising:

a body including a valve chamber defining a flowpath;

a valve shaft extending into said body;

a valve plug, having a spherically convex sealing surface, rotatably mounted in said body for limited eccentric movement about an axis in response to the movement of said valve shaft;

an annular seat ring adapted for sealing engagement with the sealing surface of said valve plug to block said flowpath;

means mounting said seat ring in said body for limited movement of the center of said annular seat ring axially to and transversely of said valve plug such that said valve plug tends to center said seat ring during closure of said valve; and

sealing means sealing the periphery of said seat ring and said body against fluid leakage.

4,519,580

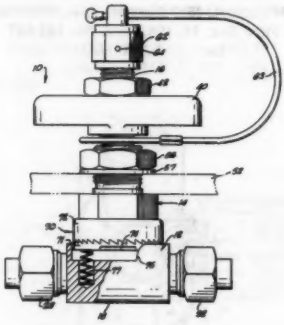
SAFE HIGH PRESSURE INSTRUMENT VALVE

Francis Leighton, Woodland Hills, and Fred W. Trebes, Northbridge, both of Calif., assignors to Air Dry Corporation, Northridge, Calif.

Continuation-in-part of Ser. No. 494,657, May 16, 1983, abandoned. This application May 15, 1984, Ser. No. 610,424

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—223 **4 Claims**



1. A valve comprising:

a body having an inlet, an outlet, and a passage between said inlet and said outlet;

a bonnet threaded onto said body;

a stem rotatable within said bonnet such that said stem is capable of blocking said passage;

an integral locking means between said body and said bonnet wherein said locking means comprises a locking element nonrotatably attached to said body such that when said bonnet is detached from said body said locking element remains nonrotatably attached to said body;

a lock nonrotatably attached to said bonnet, such that when said bonnet is detached from said body said lock remains nonrotatably attached to said bonnet; and

a means for releasably engaging said lock and said locking element; said lock and said locking element each having at least one interengaging tooth.

4,519,581

FAUCET HANDLE

Stanley M. Paul, Rye, N.Y., assignor to Paul Associates, Inc., Long Island City, N.Y.

Filed Mar. 8, 1984, Ser. No. 587,712

Int. Cl.³ F16K *31/44*

U.S. Cl. 251—268 **15 Claims**

1. A faucet handle assembly for opening and closing a cartridge type non-rising valve assembly having an outer casing and a valve stem rotatable from one closed position to another open position, comprising:

lower anchoring means for securing the faucet handle assembly to the non-rising valve assembly;

rotation means rotatably mounted on the lower anchoring means and coupled to the valve stem for rotating the stem between the open position and the closed position wherein the rotation means comprises a valve stem cover having a hole formed therein, an aligning pin disposed in the hole, a circular member fitting around the valve stem, said circular member having an internal notch, said aligning pin extending from said valve stem cover into said notch,

whereby rotational displacement of the circular member rotates the valve stem for operating the cartridge valve; and

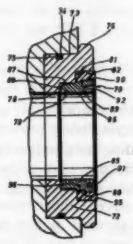
upper anchoring means journaled on the rotation means and coupled to the outer casing to secure the faucet handle assembly in place and maintain the rotation means in a fixed vertical orientation between the lower anchoring means and the upper anchoring means.

4,519,582

SEAL ASSEMBLY AND VALVE

John W. Freeman, Houston, Tex., assignor to Seaboard Wellhead Control, Inc., Houston, Tex.

Division of Ser. No. 174,821, Aug. 4, 1980, Pat. No. 4,376,526.
This application Sep. 30, 1982, Ser. No. 428,669
Int. Cl.³ F16K *3/02*
U.S. Cl. 251—328 **7 Claims**



1. A seal assembly for use in a valve, comprising:

an annular collar having an essentially cylindrical outer surface section suited for fitting into an annular recess in a valve body, and an inner surface including (a) a first essentially cylindrical section, (b) a second essentially cylindrical section having an inner diameter greater than that of the first section and having threads thereon, (c) a third essentially cylindrical section having an inner diameter greater than that of the second section, and (d) an essentially radial, annular surface interconnecting said second and third sections;

an annular retainer gland having an essentially cylindrical inner surface with substantially the same diameter as that of the first section of the collar and an outer surface having (a) a first section threaded complementary to the second collar section to accommodate the gland being threaded into the collar, (b) a second, essentially cylindrical section adjacent said threaded section, (c) a third, essentially cylindrical section radially spaced from and facing the third section of the collar when the gland is threaded into the collar, and (d) a radial outward, annular step between the second and third sections thereof; and

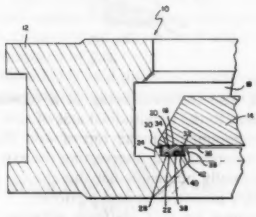
an essentially annular sealing member for placement between the collar and the gland and including an end face suited for engagement with a valve element and a radially inward flange at the opposite end thereof from said end face to fit within the undercut formed by the radial step on the gland when the gland is threaded onto the collar.

4,519,583

RETAINER FOR A REPLACEABLE VALVE SEAT

Lonnie L. Lapinoja, Sauk Rapids, Minn., assignor to General Signal Corporation, Stamford, Conn.

Filed Oct. 6, 1983, Ser. No. 539,651
Int. Cl.³ F16K *3/02, 3/30*
U.S. Cl. 251—328 **15 Claims**



1. In a valve structure having a body, a flow passage through said body, a valve element movable in said body to control the flow through said flow passage, an annular recess about said flow passage and a valve seat secured in said annular recess engaging said valve element in the closed position of said valve element, the improvement comprising:

said annular recess having an opposed inner and outer annular wall extending traverse to a base wall;

said valve seat having at least a first and second lateral surface, a base surface and a seat surface; and being insertable into said recess without deformation of said valve seat

said first and base surfaces of said valve seat engaging respectively said outer and base walls of said annular recess; and

said inner wall of said recess being sufficiently thin to be deformed at portions thereof to engage at least portions of said second surface without deformation of said second surface and to thereby retain said valve seat in said annular recess.

4,519,584

FENCE POST DRIVER

William R. McCray, 917 W. Wade, El Reno, Okla. 73036

Filed Apr. 15, 1983, Ser. No. 485,314
Int. Cl.³ E21B *19/00*
U.S. Cl. 254—29 R **8 Claims**

1. Apparatus for driving fence posts comprising:

a first pipe;

a second pipe, said first pipe being fixedly mounted on said second pipe with the longitudinal axis of said first pipe

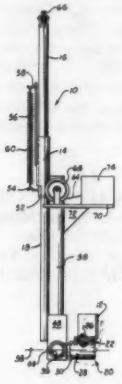
being substantially parallel and spaced apart from the longitudinal axis of said second pipe;

means for mounting the lower end of said second pipe on a vehicle, said second pipe assuming a generally upright position when so mounted;

a third pipe slidably received within said first pipe for coaxial longitudinal movement relative to said first pipe;

a post-driving structure formed on the lower end of said third pipe adapted for abutting against the top of a fence post;

a platform fixedly mounted on said second pipe adjacent its



upper end, said platform being at a substantially right angle relative to the longitudinal axis of said second pipe;

a first pulley mounted on the top of said third pipe and having its rotational axis intersecting the axis of said third pipe substantially perpendicular thereto;

a second pulley mounted on said platform;

a winch mounted on said platform adjacent said second pulley; and

a cable journaled over said first pulley and having one end fixedly attached to said first pipe, said cable further being journaled around said second pulley and having its other end wound onto said winch.

4,519,585

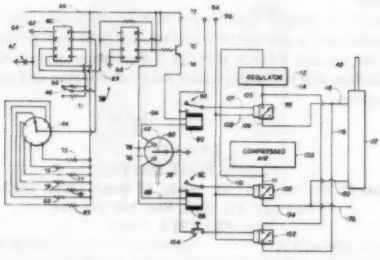
DRAWWORKS BRAKE CONTROL

Robert E. Furrow, Enid, Okla., assignor to Cooper Industries, Houston, Tex.

Filed Oct. 12, 1982, Ser. No. 433,895

Int. Cl.³ B66D *1/50, 5/26*

U.S. Cl. 254—273 **6 Claims**



1. Apparatus for controlling a brake on a drawworks having a cable wound thereon, said apparatus comprising:

means for sensing the tension level in said cable;

a first relay having a set of normally open contacts;

a pulse generator constructed to provide periodic pulses to one side of said first relay;

means for connecting the other side of said first relay to ground when said tension level is at or above a selected level;

means for disconnecting the other side of said first relay from ground when said tension level is below a selected level;

a pneumatic ram operatively connected to said brake for activating and deactivating said brake responsive to ram pressurization and depressurization;

a source of compressed air;

a first pneumatic relay operatively connected to said contacts, to said ram, and to said air source to that closing said contacts pressurizes said ram for brake deactivation and opening said contacts depressurizes said ram to permit brake activation;

a second relay having a set of normally open contacts;

a constant voltage source operatively connected to one side of said second relay for maintaining said second relay in an energized condition when the other side of said second relay is grounded;

means for connecting the other side of said second relay to ground when said tension level is at or below a selected tension level;

means for disconnecting the other side of said second relay from ground when said tension level is above a selected level; and

a second pneumatic relay operatively connected to said second relay contacts, to said ram, and to said air source so that closing said second relay contacts pressurizes said ram to prevent brake deactivation and opening said second relay contacts depressurizes said ram to permit brake deactivation.

4,519,586

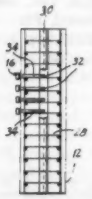
LIFETIME LIVESTOCK FENCE POST

Stanley R. Wilhelm, and George Spector, both of 233 Broadway Rm. 3615, New York, N.Y. 10007

Filed Mar. 28, 1984, Ser. No. 594,370

Int. Cl.³ E04H *17/02*

U.S. Cl. 256—51 **1 Claim**



1. A fence post which comprises:

(a) an elongated concrete body portion having at least one curved face extending longitudinally thereof;

(b) means for reinforcing said body portion to increase strength of said body portion;

(c) a plurality of relatively short transverse pins longitudinally spaced and secured within said body portion to project from said curved face of said body portion, each said transverse pin having a head portion outside of said body portion defining a space therebetween for a fencing wire to sit upon; and

(d) means for securing said fencing wire to said body portion wherein said means for reinforcing said body portion comprises;

(a) an elongated galavanized wire cage longitudinally disposed in said body portion; and

(b) an elongated reinforcing bar longitudinally disposed in center of said body portion, wherein said means for secur-

ing said fencing wire to said body portion comprises a plurality of tie wires longitudinally spaced and encircling said body portion whereby each said tie wire engages one said fencing wire on opposite sides of said body portion, further comprising:

(a) said elongated reinforcing bar having a plurality of longitudinally spaced transverse threaded apertures; and

(b) each said transverse pin having a threaded shaft to engage one said threaded aperture of said reinforcing bar so that said transverse pins will be in proper position extending through said wire cage when said body portion is formed,

(c) each of said pin transversely engaging said cage thereby supporting said pin in desired position prior to pouring concrete to form said post.

4,519,587

APPARATUS FOR REGULATING THE DELIVERY OF SOLID MATERIALS BY A BLOWING LANCE

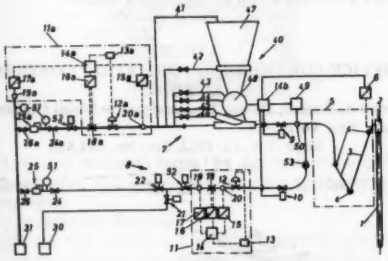
Jean Peckels, Esch/Alzette, and Antoine Schaaf, Soleuvre, both of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Oct. 21, 1983, Ser. No. 544,073

Claims priority, application Luxembourg, Oct. 27, 1982, 84444

Int. Cl.³ C21B *5/02*

U.S. Cl. 266—80 **24 Claims**



1. An apparatus for regulating the delivery of solid combustible material through a blowing lance above a pool of metal comprising:

a source of a carrier gas;

supply circuit means for delivering solid combustible material suspended in said carrier gas to a blowing lance;

flushing circuit means for delivering flushing gas to said blowing lance;

means for controlling the flow rate of said solid combustible material to vary said flow rate over a range of operation;

means for controlling the flow rates of said carrier gas and said flushing gas to vary said flow rates of said carrier gas and said flushing gas over a range of operation; and

means for connecting said supply circuit means and said flushing circuit means separately or concurrently to said blowing lance;

said means for controlling the flow rate of said solid combustible material including:

a fluidizing system, said fluidizing system having a rotating cellular regulator and a reservoir;

means for sensing conduit pressure downstream from said fluidizing system;

means for comparing said downstream pressure with a desired pressure and adjusting the speed of said rotating cellular regulator; and

a plurality of conduit means connected to said fluidizing system carrying pressurized gas thereto.

4,519,588

MOLTEN COPPER OXYGENATION APPARATUS

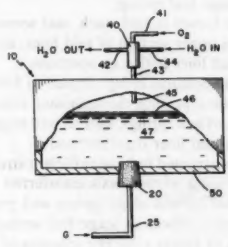
William G. Staib, Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Division of Ser. No. 510,091, Jul. 1, 1983, Pat. No. 4,469,518.

This application Jul. 23, 1984, Ser. No. 633,330

Int. Cl.³ C21C *5/48*

U.S. Cl. 266—220 **4 Claims**



1. An improved vessel, for the oxygenation of a continuous stream of molten copper, of the type having an entrance launder for receiving a stream of molten metal from a furnace; top, bottom, and sides for containing the stream of the molten copper; and an exit launder for discharging treated molten copper to another vessel,

wherein the improvement comprises the combination of a gas permeable molten copper impervious plug mounted in the bottom of said oxygenation vessel and in communication with a source of gas,

and a lance mounted in said top directly above, and pointed toward, said plug and in communication with a source of oxygen.

4,519,589

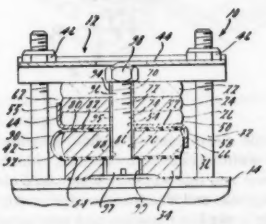
ANTI-SPLAY SHIM FOR A TWO STAGE LEAF SPRING ASSEMBLY

Larry Skynar, Northville, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Nov. 22, 1982, Ser. No. 443,842

Int. Cl.³ B60G *19/02*

U.S. Cl. 267—52 **3 Claims**



1. A two stage leaf spring assembly for a vehicle, said leaf spring assembly characterized by:

a stack of leaves forming a first stage leaf spring assembly section;

means for fastening the stack of leaves together;

a second stage leaf interposed between said stack of leaves and a spring seat attached to an axle of the vehicle;

said second stage leaf having ends normally spaced from said stack of leaves when said vehicle is in an unloaded position;

a shim member interposed between an axial center portion of the stack of leaves and the center portion of the second stage leaf;

said shim member having an upturned flange abutting a side of the stack of leaves and a downturned flange abutting an opposite facing side of the second stage leaf;

a one-piece low friction liner being folded about both upper and lower faces of the second stage leaf spring such that an upper section of said liner is interposed between said shim and said second stage leaf spring and a lower section of said liner interposed between said spring seat and said second stage leaf spring;

each of said leaves in said stack, said second stage leaf, said shim, said upper section of said liner, and said lower section of said liner define an aperture;

said defined apertures being aligned to form a passage;

securing means passing through said passage for securing said stack of leaf springs, said second stage leaf spring, said shim, and said liner together; and

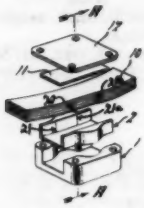
said shim constructed to have sufficient strength for resisting torque about a vertical axis transferred from said spring seat to said second stage spring and preventing relative rotation of said second stage leaf spring with respect to said stack of leaves whereby splaying of the second stage leaf is minimized.

4,519,590

AXLE CLAMP FOR FILAMENT REINFORCED SYNTHETIC MATERIAL LEAF SPRINGS

Wayne E. Wells, Farmington Hills, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 5, 1983, Ser. No. 455,695
Int. Cl.³ F16F *1/30*
U.S. Cl. 267—52 **10 Claims**



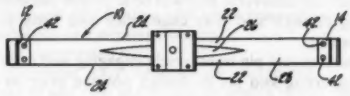
1. An axle clamp adapted to hold a synthetic material leaf spring in position relative to an axle, which leaf spring has upper, lower and side surfaces, which axle clamp comprises a rigid clamp base and a resilient wedge insert, said clamp base comprising a platform portion and two substantially parallel side walls extending from said platform portion to form a channel adapted to receive said wedge insert, the inner surface of at least one said side wall providing a channel-widening concavity, and said wedge insert comprising a wedge insert platform portion and two substantially parallel wedge insert side walls extending from said wedge insert platform portion to form an inner channel adapted to have planar surface contact with said side surfaces of said leaf spring at a mid-portion of said leaf spring for frictional engagement thereof to provide longitudinal positioning of said leaf spring, the outer surface of at least one said wedge insert side wall providing a convexity adapted to engage and substantially fill said channel-widening concavity; and means for clamping said leaf spring in said clamp base.

4,519,591

NON-METALLIC LEAF SPRING STRUCTURE

John W. Bush, 50740 Jefferson, New Baltimore, Mich. 48047, and Peter C. Bertelson, 30325 Ponds View Dr., Franklin, Mich. 48025

Filed Aug. 20, 1982, Ser. No. 410,171
Int. Cl.³ F16F *1/18*
U.S. Cl. 267—148 **11 Claims**



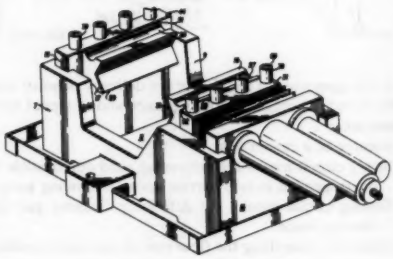
1. A leaf spring having a pair of identical elongated body members constructed of continuous strands in a matrix of polymerized plastic resin, each said body member varying in thickness and width in opposite directions from a midportion substantially midway of its length, each said body member having its greatest thickness and its minimum width at said midportion and diminishing in thickness and increasing in width toward opposite ends, each said body member having at least one straight side edge and a constant cross-sectional area throughout the remaining portion of said body member, said pair of identical body members being arranged with the straight side edge of each body member facing in opposite directions and disposed parallel to each other to form a spring having a uniform width throughout its length.

4,519,592

DEVICE FOR HOLDING FORMATION CORES FOR BORING

Gordon A. Russell, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 14, 1983, Ser. No. 551,623
Int. Cl.³ E21C *11/00*
U.S. Cl. 269—25 **14 Claims**



1. A device for holding objects for boring comprising:

a first vise jaw having an object holding face;

a second vise jaw having an object holding face;

first means for supporting said first vise jaw so that it is rotatable about a pivot axis thereof passing through its object holding face;

second means for supporting said second vise jaw so that it is rotatable about a pivot axis thereof passing through its object holding face;

means for respectively holding said first and second jaws in predetermined rotatable positions thereof;

said first and second supporting means each comprising a vise jaw support element, and said holding means comprises, for each vise jaw, at least one projection arranged radially of a respective vise jaw rotation axis and on one of said support element and its associated vise jaw and a plurality of bores arranged annularly and radially of said

rotation axis and provided at the other of said support element and associated vise jaw, said bores engaging with said projection at different rotatable positions of said associated vise jaw to hold it at said predetermined rotatable positions, and means for respectively biasing each of said vise jaws to its respective support element, each said vise jaw being manually separable from a respective support element against said biasing means to disengage an associated projection from said bores and permit rotation of the vise jaw about its respective pivot axis; and

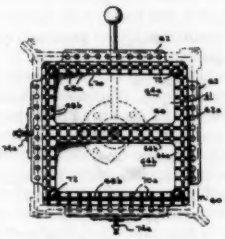
means for reciprocally moving at least one of said first and second supporting means to adjust the relative distance between said first and second vise jaws.

4,519,593

GRID ASSEMBLY FIXTURE, RETENTION STRAP

Richard M. Kobuck, Delmont, and Ralph W. Kalkbrenner, Irwin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 1, 1982, Ser. No. 414,198
Int. Cl.³ E04G *17/00*
U.S. Cl. 269—40 **13 Claims**



1. A grid assembly fixture for use in assembling mating, perpendicular inner straps and outer straps into a grid assembly comprising:

(a) a generally flat plate;

(b) first and second sets of spaced parallel grooves in a surface of said plate, said grooves of said sets being at right angles to each other, the bottom of said grooves lying in a common plane, and said grooves of said sets intersecting; and

(c) retention strap means for extending about the periphery of a grid assembled on said grid assembly fixture, with said retention strap means comprising first and second pairs of bars, the bars of each pair comprising hinge means for hingedly connecting the bars of each pair, with each said bar having a pair of end posts and a connecting cross member extending between them, and with said end posts having openings therethrough located above and below the connecting cross member.

4,519,594

FORMER FOR A FOLDER IN A WEB-FED ROTARY PRINTING PRESS

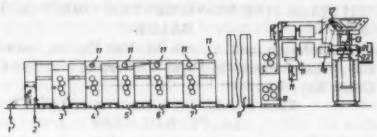
Otto T. Weschenfelder, and Günter K. Schmitt, both of Würzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Fed. Rep. of Germany

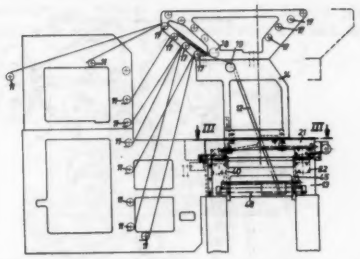
Filed Mar. 19, 1984, Ser. No. 591,081
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1983, 3310746
Int. Cl.³ B41F *13/56*
U.S. Cl. 270—20.1 **4 Claims**

1. A former assembly for a folder in a web-fed rotary printing press, said former assembly comprising:

a pair of spaced side frames rotatably supported for rotation along a path about a generally vertical axis above a group of folder cylinders;

former means supported between said spaced side frames; and





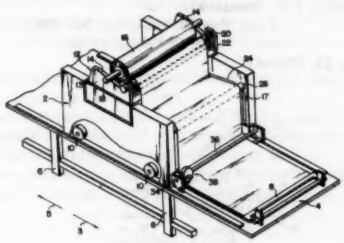
locking means for securing said spaced side frames at spaced points along said path of rotation.

4,519,595

APPARATUS FOR UNWINDING FABRIC FROM A ROLL

Shoichi Adachi, Oosaka, Japan, assignor to N.C.A. Co., Ltd., Oosaka, Japan

Filed Jul. 10, 1984, Ser. No. 629,514
Int. Cl.³ B65H *29/46*
U.S. Cl. 270—31 **17 Claims**



1. An apparatus for unwinding a roll of a fabric taken up on a shaft which comprises:

a rectangular work table;

a travelling body mounted on the work table to be moved lengthwise back and forth;

a support table which is built on the travelling body and can be swung about an axis substantially perpendicular to the work table and which supports a fabric roll in such a manner that it can be rotated about its axis;

an unwinding roll rotatably supported on the support table so as to be contacted with the fabric roll; and

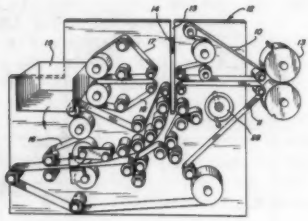
feed means for forwarding the fabric unwound from its roll by means of the unwinding roll to the work table lying ahead of the travelling body, and

wherein, when the travelling body runs backward and the unwinding roll is rotated, the fabric is unfurled from its roll, the feed means forwards the unwound fabric to the work table, and, when the support table is swung, the fabric is conveyed to the work table in such a manner that the front and back sides of the fabric are alternately kept upward.

4,519,596
METHOD AND APPARATUS FOR FOLDING DIAPERS WITH SELECTIVE MOVEMENT OF ORBIT OF TUCKER BALDE

Gary E. Johnson, and Andrew M. Van Egeren, both of Green Bay, Wis., assignors to Paper Converting Machine Company, Green Bay, Wis.

Filed Jul. 13, 1984, Ser. No. 630,647
Int. Cl.³ B41L *43/00*
U.S. Cl. 270—32 **14 Claims**

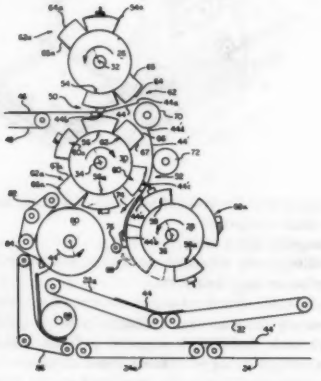


1. A method for operating a diaper-producing machine comprising advancing a series of unfolded diapers along a horizontal path, orbiting a tucker blade for each diaper through said horizontal path to fold the diaper and deliver the now-folded diaper to a vertical path, and displacing the orbit of said tucker blade upwardly out of said horizontal path whenever a defective diaper appears in said series.

4,519,597
FOLDING APPARATUS WITH COMPOUND TUCKER BLADE MOTION

Ronald F. DeSanto, Palos Hills, Ill., assignor to The Lehigh Press, Inc., Pennsauken, N.J.

Filed May 10, 1984, Ser. No. 608,950
Int. Cl.³ B41L *31/08*
U.S. Cl. 270—42 **16 Claims**

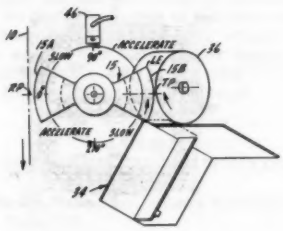


1. A folding apparatus for separating a web into individual signatures and producing two folds in each signature, comprising: an upper cylinder, a lower cylinder and an intermediate cylinder located between the upper and lower cylinders, each said cylinder being rotatable about an axis; the axes of said upper and said intermediate cylinders being parallel and spaced apart to define a given plane and the axis of said lower cylinder being parallel to the axes of the first and intermediate cylinders and offset from said given plane; means for rotating said upper and lower cylinders in the same direction and said intermediate cylinder in the opposite direction; first and second folding means for producing said two folds in each said signature; said first folding means comprising first tucker means carried on said upper cylinder and cooperating first jaw means carried on said intermediate cylinder; said second folding means comprising second tucker means carried on said lower cylinder and cooperating second jaw means carried on said intermediate cylinder; and means for cutting the web to produce the individual signatures.

4,519,598
SIGNATURE GATHERING MACHINE WITH SEGMENT WHEEL CALIBRATED TO MAIN DRIVE SHAFT

William B. McCain, Hinsdale, and Elmer Bewersdorf, Downers Grove, both of Ill., assignors to McCain Manufacturing Corporation, Chicago, Ill.

Filed Apr. 2, 1984, Ser. No. 596,233
Int. Cl.³ B42B *2/00*
U.S. Cl. 270—53 **5 Claims**



1. In a cyclically operable machine for gathering signatures fed by pocket feeders from individual supply pockets to a signature gatherer moving past the pockets at a predetermined lineal speed per machine cycle, in which separate insert sheets or the like delivered from an insert magazine are to be gathered individually with successive signatures, and in which each insert sheet so delivered is captured by a wheel rotated by an upright shaft on an axis at one side of the gatherer, is next moved by the wheel past a glue dabber to receive a spot of glue for adherence to the signature and finally is presented by the wheel for release to and adherence to a signature being advanced by the gatherer:

a main drive shaft for driving the gatherer at a predetermined lineal speed;

a second drive shaft and means for driving the second drive shaft from the main drive shaft;

said second drive shaft having a drive arm fixed thereto to rotate therewith;

a driven shaft immediately adjacent said second drive shaft and having its axis of rotation parallel to and offset from the second drive shaft;

said driven shaft having a driven arm connected thereto and said driven arm supporting one end of a drive pin, which drive pin has the opposite end disposed freely in a slot presented by said drive arm so that as the latter is rotated from 0° through 180° the pin traverses the slot in one direction and traverses the slot in the opposite direction as the drive arm rotates from 180° to 360°;

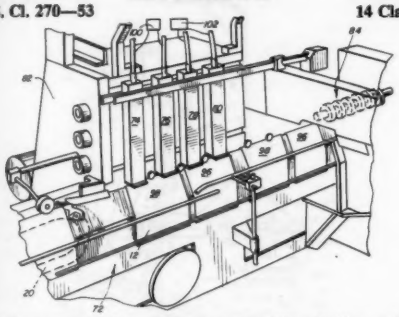
and a drive connection from said driven shaft to said upright shaft, the offset between the drive shaft and driven shaft and the effective length of the driven arm being selected to calibrate the lineal speed of the wheel to substantially that of the gatherer at the time of release

4,519,599

METHOD AND APPARATUS FOR TANDEM STITCHING OF BOOKS IN A BINDERY LINE

Theodore W. Mayer, Chicago, Ill., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed May 11, 1984, Ser. No. 610,657
Int. Cl.³ B42B *1/02*
U.S. Cl. 270—53 **14 Claims**



1. In apparatus for gathering and saddle stitching printed signatures each of which has a closed side, a head end and a tail end, to form books consisting of said signatures, said apparatus including a line of signature feeding stations, each of said stations having a signature supply hopper and means for feeding signatures seriatim from said supply hopper, and there being a cover means feeding station at a downstream end of said line, an endless saddle-type gathering conveyor moving in front of said feeding stations, said conveyor having signature carrying segments each of which gathers signatures fed successively from selected ones of said feeding stations to straddle the carrying segments in overlying relationship with their closed sides up and thus form unbound books each of which includes cover means and each said carrying segment having a pusher lug to bear against the tail ends of signatures in a forming unbound book, and a saddle stitcher that has stitcher head means and shuttle conveyor means to receive the unbound books and deliver them stepwise to and then through the stitcher head means, the improvement comprising, in combination:

the shuttle conveyor means includes a plurality of sets of gripper means to grip two successive unbound books for handling as a tandem set as they leave the gathering conveyor and move said unbound books in said tandem set to the stitcher head means simultaneously;

the stitcher head means has two sets of stitcher heads to simultaneously bind both books of a tandem set;

and the shuttle conveyor means is adapted to simultaneously remove a tandem set of bound books from the stitcher head means and deliver the next succeeding tandem set of unbound books to the stitcher head means.

4,519,600

CARD FEEDING, TRANSFER AND OUTPUT APPARATUS FOR AN AUTOMATIC EMBOSSING SYSTEM

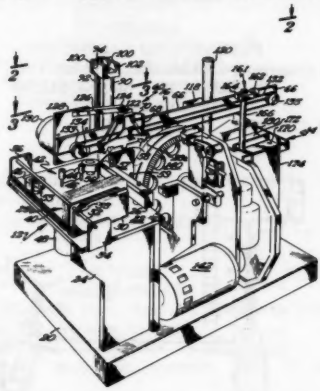
Dennis J. Warwick, Richfield; Richard C. Nubson, Eden Prairie, and Ronald B. Howes, Jr., Minneapolis, all of Minn., assignors to Data Card Corporation, Minnetonka, Minn.

Filed Sep. 21, 1983, Ser. No. 534,350
Int. Cl.³ B65H *5/22*
U.S. Cl. 271—4 **13 Claims**

1. Apparatus for receiving a stack of cards to be embossed and for individually feeding cards into a card transfer path of an embossing mechanism in an automatic embossing system, each of the cards in the stack of cards being vertically aligned and resting on an edge thereof, the stack of cards having a top, a bottom, first and second ends and first and second sides, said apparatus comprising:

(a) an input hopper for receiving a stack of cards to be embossed, said input hopper comprising:

1. a hopper plate supporting the bottom of the card stack;
2. a guide rail mounted on the hopper plate and engaging the first side of the card stack;
3. a card picker cam mounted for limited rotational movement on the hopper plate and positioned adjacent the first end of the card stack, the picker cam constructed and arranged with a projecting lobe portion for engaging the edge of the card and sliding the card across the end of the stack into the transfer path;
4. a backup plate slidably mounted on the hopper plate engaging the second end of the card stack and including



means for urging the stack of cards into engagement with the card picker cam;

(b) card guide means mounted adjacent the hopper plate and aligned with the transfer path for receiving a card stripped from the card stack in the input hopper and supporting the card in vertical alignment with the top edge thereof exposed;

(c) carriage means constructed and arranged for engaging the top edge of a card;

(d) first positioning means for moving the carriage means horizontally along the card transfer path between the card guide means and the embossing apparatus; and

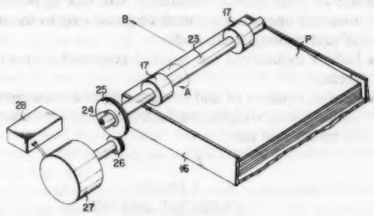
(e) second positioning means for moving the carriage means vertically to engage a card in the card guide means.

4,519,601

SHEET FEEDING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 2, 1982, Ser. No. 446,415
Int. Cl.³ B65H *3/06*
U.S. Cl. 271—114 **4 Claims**



1. A sheet feeding apparatus comprising:

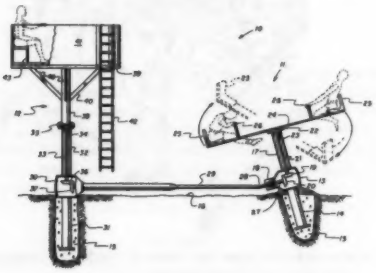
transfer roller means for conveying the sheet by utilizing rotation frictional force;

one-way clutch means, connected to said transfer roller means, for rotating said transfer roller means intermittently in one direction;

step motor means for rotating said transfer roller means via said one-way clutch means thereby conveying the sheet along a given path; and

motor control means for gradually decelerating said step motor means at a rate to cause a rotation angle of said transfer roller means during deceleration to be greater than an overdrive rotation angle determined by inherent inertia of said transfer roller means and said one-way clutch means.

4,519,602
PLAYGROUND CARROUSEL
Donald Sutherland, 6510 Micollet, Houston, Tex. 77016
Filed Jul. 11, 1983, Ser. No. 512,346
Int. Cl.³ A63G *1/12*
U.S. Cl. 272—33 R **13 Claims**



1. An amusement carrousel apparatus, comprising

a carrousel supporting structure extending from the ground at a small angle from the vertical for supporting a carrousel in an inclined position,

an occupant actuated and occupant supporting carrousel having a pivot supported angularly for rotary movement by said carrousel supporting structure,

an axle fixed to the carrousel at the pivot thereof for rotary movement with said carrousel and journaled in the carrousel supporting structure,

a first gear means mounted in said carrousel supporting structure and connecting to said axle,

a driving shaft extending horizontally from and operatively connected to said gear means,

a tub supporting structure extending vertically from the ground and having a supporting platform spaced from the carrousel supporting structure for supporting a tub thereon,

an axle journaled in said tub supporting structure for rotary movement with said supporting platform,

a second gear means mounted in said tub supporting structure and operatively connecting said axle to the other end of said driving shaft, and

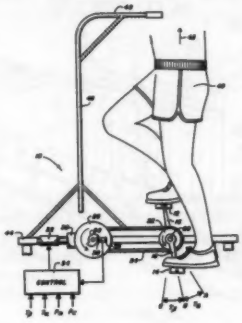
a hollow cylindrical tub secured atop said supporting platform,

whereby, rotation of said carrousel by the occupants thereof shifting their weights is effective to transmit rotary motion to rotate said tub.

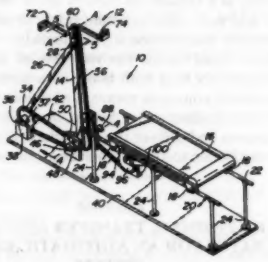
4,519,603
EXERCISE DEVICE
Richard J. DeCloux, 1485 Belmont St., Manchester, N.H. 03104
Filed Dec. 2, 1982, Ser. No. 446,479
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—73 **11 Claims**

1. A stationary leg-operated, pedal-driven, rotary pedal motion, stand-up, body-lifting exercising device having brake means including

means for controlling said brake means for applying a first braking force, and for cyclically applying an increased braking force twice during each pedalling cycle to simulate uphill stand-up pedalling of a bicycle such that an increased resistance is produced twice during each pedalling cycle, whereby the user with one foot on the lower pedal can move himself and can stand up onto the upper pedal aided by the increased braking force as in uphill pedalling.



4,519,604
EXERCISE MACHINE
Raymond Arzounian, 4332 Howland St., Philadelphia, Pa. 19124
Filed Jul. 29, 1983, Ser. No. 518,492
Int. Cl.³ A63B *21/00*
U.S. Cl. 272—73 **11 Claims**



1. An exercise machine, comprising:

pedal means mounted for rotation about a longitudinal axis,

crib means for supporting a user and mounted for oscillating motion along a linear path,

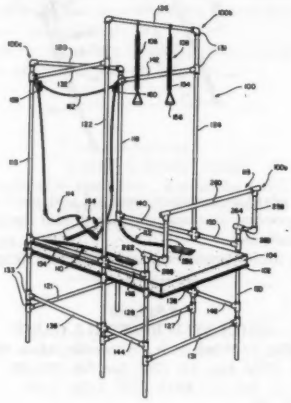
means coupled to said pedal means for causing oscillating movement of said pedal assembly along a prescribed arc in response to rotation of said pedal assembly about said longitudinal axis, and

means for causing oscillating movement of said crib means along said linear path in synchronism with said oscillating movement of said pedal assembly along said prescribed arc.

4,519,605
COMBINATION EXERCISE AND MASSAGE APPARATUS

Ragnvald G. Leland, P.O. Box 4174, Palm Springs, Calif. 92263

Filed Oct. 19, 1982, Ser. No. 435,329
Int. Cl.[3] A63B *21/00*
U.S. Cl. 272—116 10 Claims



1. Apparatus comprising:

platform means for supporting a person; massage means for engaging the body of a user, said massage means comprising an elongate flexible element and a massage element;

first arm means extending upwardly from a first end of said platform means for securing said massage means, whereby a person standing adjacent said platform means may grasp and pull alternately in a to-and-fro movement said elongate element to cause said massage element to massage a user's body; and

removable gate means extending upwardly from a second end of said platform for slidably receiving said flexible element, whereby a person sitting upon said platform means and facing said gate means may, with the elongate flexible element passing over said gate means, grasp said elongate flexible element and alternately pull in a to-and-fro movement to cause massaging movement of said massage element on a user's body.

4,519,606
SPELLING GAME

Guy W. Lussier, P.O. Box 110, Rte. 3, Golden, Colo. 80401

Filed Jul. 26, 1982, Ser. No. 401,619
Int. Cl.[3] A63F *9/18*
U.S. Cl. 273—1 R 4 Claims

1. A method of playing a spelling game for a plurality players comprising the steps of

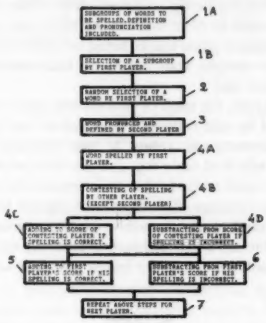
(A) Providing a group of words to be spelled, each word having associated therewith its definition and pronunciation,

(B) Randomly selecting a word from said group by a first player of said plurality,

(C) Giving the pronunciation and definition of said selected word to said first player by a second player,

(D) Spelling said word by said first player,

(E) Adding to a score for said first player if the spelling is correct,


SUBGROUPS OF WORDS TO BE SPELLED.DEFINITION AND PRONUNCIATION INCLUDED.
1A
SELECTION OF A SUBGROUP BY FIRST PLAYER.
1B
RANDOM SELECTION OF A WORD BY FIRST PLAYER.
2
WORD PRONOUNCED AND DEFINED BY SECOND PLAYER
3
WORD SPELLED BY FIRST PLAYER.
4A
CONTESTING OF SPELLING BY OTHER PLAYER. (EXCEPT SECOND PLAYER)
4B
4C
ADDING TO SCORE OF CONTESTING PLAYER IF SPELLING IS CORRECT.
4D
SUBSTRACTING FROM SCORE OF CONTESTING PLAYER IF SPELLING IS INCORRECT.
5
ADDING TO FIRST PLAYER'S SCORE IF HIS SPELLING IS CORRECT.
SUBSTRACTING FROM FIRST PLAYER'S SCORE IF HIS SPELLING IS INCORRECT.
6
REPEAT ABOVE STEPS FOR NEXT PLAYER.
7

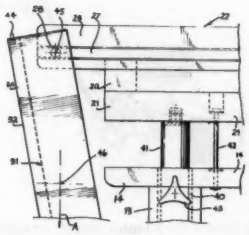
(F) Substracting from a score for said first player if the spelling is incorrect, and

(G) Repeating the steps for each player.

4,519,607
GAME TABLE

Alfred G. Schill, Noble Park, Australia, assignor to Prestige Billiards Pty. Ltd., Victoria, Australia

Filed Jul. 21, 1982, Ser. No. 400,270
Claims priority, application Australia, Mar. 12, 1982, 81373/82
Int. Cl.[3] A63D *15/00*
U.S. Cl. 273—5 B 4 Claims



1. A games table comprising:

a first table top for use as a game playing surface;

leg support means for supporting said first table top in an essentially horizontal position at a first predetermined height above ground level;

elevation means between said leg support means and said first table top to move said first table top to a second predetermined position, and fastening means to secure said first table top at said first predetermined position or at said second predetermined position;

at least two second table top elements which can be moved to form a second table top;

upright wall means extending from said first table top for supporting said second table top elements in a co-extensive arrangement forming said second table top above said first table top; and

means for providing rolled and pivoted movement of said second table top elements between either (i) positions essentially below said first table top, or (ii) said co-extensive arrangement forming said second table top, said means for providing rolled and pivoted movement including,

(a) channel guide tracks and rollers,

(b) each channel guide track having one roller arranged with respect thereto for rolling movement of said roller inside and along said channel guide track,

(c) said rollers being mounted either from said upright wall means or from said second table top elements, and said channel guide tracks being mounted from the other of said upright wall means or said second table top elements, and

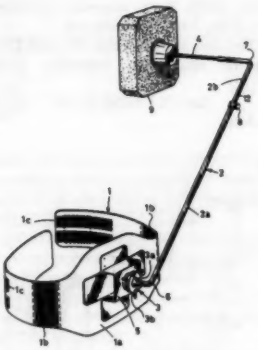
(d) pivot axes, for each of said second table top elements, defined by said rollers so that each of said second table top elements can rotate to said positions essentially below said first table top, and the centers of gravity for each of said second table top elements being such that the top surfaces of each of said second table top elements are brought to non-vertical positions under said first table top when said second table top elements are in said positions essentially below said first table top.

4,519,608

TENNIS RACKET STROKE TRAINING DEVICE

Pierre E. Gilly, 13 rue des Abondances, Boulogne (Hauts de Seine), France

Filed Sep. 3, 1982, Ser. No. 414,914
Claims priority, application France, Sep. 29, 1981, 81 18332
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—29 A **7 Claims**



1. A training device for a tennis player, comprising a harness having a dorsal part and being adapted to be worn on the torso of the player, a telescopic rod having means at one end constituting an abstacle for the player's racket and being adjustably attached at its other end to the center of said dorsal part by a ball and socket joint, so that the obstacle means may be selectively arranged in a position close to that which the racket is required to assume at one end of its travel during the execution of a predetermined stroke.

4,519,609

MODULAR RAKE SHAFT ASSEMBLY

Richard D. Lenhart, Arvada, and Roger D. Lindblad, Westminster, both of Colo., assignors to Zot Manufacturing Company, Arvada, Colo.

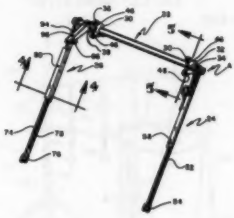
Filed Jan. 13, 1984, Ser. No. 570,640
Int. Cl.³ A63D *5/08*
U.S. Cl. 273—54 A **15 Claims**

1. A modular rake shaft assembly for an automatic bowling pin setting machine, said modular assembly comprising:

a pair of spaced parallel elongated rake arms, each arm being tubular and having a first end and a second end, a yoke connected to said first end of each arm for pivotal attachment to a rake board and a pivot means mounted on said second end of each arm along an axis transverse to said arms;

a removable shaft extending between said pivot means;

a flange plate at each end of said shaft;



a flange plate mounted on each of said pivot means and corresponding in shape and size to said flange plates on said shaft; and

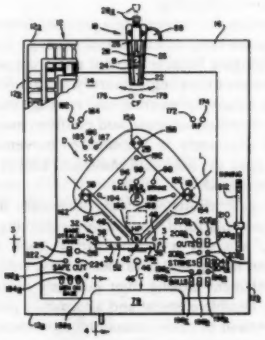
fastening means connecting said respective flange plates.

4,519,610

SIMULATED BASEBALL GAME

Leo W. Kallio, 71 Windsor St., Worcester, Mass. 01605

Filed Aug. 12, 1983, Ser. No. 522,481
Int. Cl.³ A63F *7/20, 7/30, 7/36*
U.S. Cl. 273—89 **4 Claims**



1. A simulated baseball game comprising:

A. a housing including a flat upper wall and a lower wall;

B. indicia on said upper wall representing a baseball field including the usual diamond and outfield locations;

C. ball pitching means mounted to said housing for pitching a small ball across said upper wall toward the home plate area thereon;

D. batting means movably mounted to said upper wall adjacent the home plate area for swinging at a pitched ball, said batting means including:

(1) a miniature bat,

(2) a pivot pin projecting at right angles from a location adjacent one end of said bat,

(3) first and second pin-receiving sockets formed in said upper wall at locations spaced on opposite sides of home plate so that the bat can be swung from left- and right-handed positions across home plate by inserting the pivot pin in one or the other of said sockets, and

(4) "broken wrist" signalling means for signalling when said bat has been swung through a selected minimum angle; and

E. a first set of pockets formed side by side in said upper wall behind home plate for receiving a pitched ball that is not

hit by the batting means, at least one said pocket located directly behind home plate being a strike-designating pocket, and pockets on opposite sides of said strike-designating pocket being ball-designating pockets;

F. a second set of ball-receiving pockets formed in said upper wall around the perimeter of said outfield, different ones of said pockets in the various outfield sectors being designated for the usual hit and run situations that occur at the fielding positions within those sectors during an actual game of baseball; and

G. means for signalling when a pitched ball is received in one or another of said pockets.

4,519,611

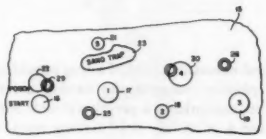
SLIDING RING GAME

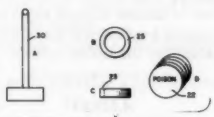
Ned R. Sands, 2230 Holly Ave., Escondido, Calif. 92027

Filed Oct. 14, 1983, Ser. No. 542,141

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—126 R **1 Claim**





1. A game set for playing on a flat planar playing field surface, comprising in combination,

a set of rings each defining a central see-through aperture and carrying indicia differentiating certain of said rings from other rings and signifying individual movable playing members and presenting a surface for sliding over said planar surface in a direction and length dependent upon a player's skill when the ring is impacted by a blow delivered by a player parallel to the surface,

at least one mallet constructed to strike said blow when manually swung by a player's arm,

and a set of removable thin markers having indicia thereon designating a course sequence from marker to marker and each marker designating a scoring area of a size at least that of the ring aperture for visual exposure thereby when the rings are positioned thereover, said markers being constructed for removably adhering to the playing field surface in a plurality of positions designating a playing course and having a surface structure permitting the rings to slide thereover when in place on said surface without substantial interference for positioning at will on said surface in response to mallet strikes with the marker positions defining a plurality of scoring stations for dispersal throughout the playing course over which the rings are played by sequentially striking the rings toward scoring areas defined by the individual markers and made visible within the ring aperture when positioned in the scoring zone on the markers positioned on the surface, and the areas of said geometric markers in the set include different markers with smaller and larger scoring areas thereon making it more and less difficult to place a ring in some scoring areas.

4,519,612

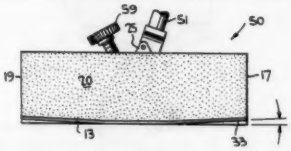
GOLF PUTTER

Thomas K. Tsao, 441 Discovery Rd., Virginia Beach, Va. 23451

Filed May 17, 1983, Ser. No. 495,502

Int. Cl.³ A63B *69/36, 53/04*

U.S. Cl. 273—163 R **17 Claims**



12. A golf putter comprising a club head having a bottom surface intersecting a forward-facing putting face to define a bottom edge, said club head having a length dimension defined between a proximal end and a distal end, said bottom surface having a lowermost flat portion with different lengths along said bottom surface, the shortest of said lengths being disposed at a straight intermediate segment of said bottom edge, wherein said bottom edge includes first and second straight end segments which are coplanar with and flank said intermediate segment, said end segments each sloping upward and away from said intermediate segment in respective opposite lengthwise directions along said club head.

4,519,613

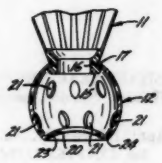
BADMINTON SHUTTLECOCK

Raymond G. Martin, 8160 W. State Street Rd., Winnebago, Ill.

Filed Feb. 27, 1984, Ser. No. 583,588

Int. Cl.³ A63B *67/18*

U.S. Cl. 273—417 **2 Claims**



1. A badminton shuttlecock comprising a generally frustoconical skirt and a striking cap having an inner end attached to the smaller end of said skirt, said striking cap comprising a hollow member made of plastic, said striking cap being shaped generally as a sphere with truncated inner and outer ends, the outer end portion of said striking cap being defined by an inwardly tapered generally frustoconical depressed surface, an opening formed through the center of said surface and communicating with the interior of said cap, and a series of holes formed through the spherical portion of said cap to permit air to flow through said cap.

4,519,614

GENERALLY CYLINDRICAL ROTARY DRILL FACE SEAL HAVING IMPROVED RESISTANCE TO RADIAL DISTORTION

Lloyd L. Garner, Fort Worth, Tex., assignor to Rock Bit Industries U.S.A., Inc., Fort Worth, Tex.

Filed Apr. 9, 1984, Ser. No. 598,229

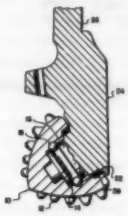
Int. Cl.³ F16J *15/34*

U.S. Cl. 277—84 **14 Claims**

1. A rotary seal for utilization with an earth boring drill bit having a drill bit body with a shaft rigidly mounted on a face

surface thereof and a rolling cutter having a face surface rotatably mounted on said shaft, said seal comprising:

a generally cylindrical elastomeric seal having generally parallel sides and rounded ends and a longitudinal dimension which is greater than the thickness of said seal, said generally cylindrical elastomeric seal having a first rounded end in sealing and sliding engagement with said face surface of said drill bit body and a second rounded



end in sealing and sliding engagement with said face surface of said rolling cutter; and

a rigid cylindrical ring entirely disposed within said generally cylindrical elastomeric seal for minimizing radial distortion of said generally cylindrical elastomeric seal in response to axial compression thereof wherein said generally cylindrical elastomeric seal and said shaft will remain separated despite compression of said generally cylindrical elastomeric seal.

4,519,615

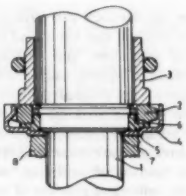
SHAFT SEAL DEVICE

Bengt Björklund, Handen, Sweden, assignor to AB Grindex, Handen, Sweden

Filed Apr. 11, 1984, Ser. No. 599,094

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—92 **2 Claims**



1. A mechanical seal device for a rotating shaft comprising:

stationary seal means mounted on the shaft;

rotating seal means sealingly engaging said stationary seal means;

a cup-shaped formation disposed in a predetermined axial position on the shaft and mounted for rotation therewith, said formation surrounding said rotating seal means and positively engaging the same for joint rotation therewith; and

a flexible element positioned in said cup between the shaft and said rotatable seal means to axially and radially position said rotatable seal means.

4,519,616

SHAFT SEAL

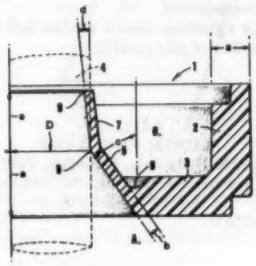
David E. Johnston, Gosforth, England, assignor to George Angus & Company Limited, Newcastle, England

Filed Oct. 21, 1983, Ser. No. 544,248

Claims priority, application United Kingdom, Oct. 25, 1982, 8230453

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—152 **6 Claims**



1. A shaft seal consisting only of a ring moulded in one piece from a rigid plastics material and having a relatively thick holding portion, comprising a peripheral wall and a transverse radial wall, and a relatively thin sealing head, comprising a frusto-conical leg, leading from the radial wall with an abrupt reduction in thickness in the ratio of about 4:1 at the junction with the radial wall, forming a hinge portion to enable the leg to flex, and a sealing bush comprising a frusto-conical extension of the leg but of smaller conical angle so that, for a given interference fit against a cylindrical sealed surface, the bush lies in use almost parallel to the sealed surface.

4,519,617

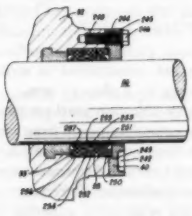
CUSHIONING UNIT SHAFT SEAL ARRANGEMENT

William S. Butler, Burleson, Tex., assignor to Halliburton Company, Duncan, Okla.

Filed Sep. 19, 1983, Ser. No. 533,839

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—153 **9 Claims**



1. A piston shaft seal assembly for an end-of-car hydraulic cushioning unit having a housing and a piston shaft extending therefrom, said piston shaft seal assembly comprising:

an annular seal retainer; a first continuous substantially elastomeric annular oil scraper seal having a scraper lip thereon sealingly engaging said piston shaft and extending in one direction therealong, the first annular oil scraper seal having a portion thereof abutting a portion of the annular seal retainer;

a reinforced continuous substantially elastomeric annular oil scraper seal having a scraper lip thereon sealingly engaging said piston shaft and extending in another direction therealong, the scraper lip including an annular coil spring biasing means to bias the scraper lip of the seal into sealing engage-

ment with said piston shaft, the reinforced annular oil scraper seal having a portion thereof abutting a portion of the first annular oil scraper seal; and

a second continuous substantially elastomeric annular oil scraper seal having a scraper lip thereon sealingly said piston shaft and extending in said another direction therealong.

4,519,618

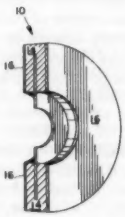
MULTI-CHARACTERISTICS SEAL MEMBER FOR TESTING UNCAPPED CONTAINER MEANS

Walter C. Klingel, Sr., 4773 58th Ave. N., St. Petersburg, Fla. 33714

Continuation of Ser. No. 530,117, Sep. 7, 1983, abandoned, which is a continuation of Ser. No. 310,908, Oct. 13, 1981, abandoned. This application Jun. 11, 1984, Ser. No. 619,725

Int. Cl.³ F16J *15/10;* **G01M** *3/04*

U.S. Cl. 277—228 **16 Claims**



1. A static seal member of the type designed to test uncapped container means for structural imperfections known as microsplits, comprising, in combination:

a first, flat skin portion having a first predetermined high hardness rating,

a second, flat skin portion having a first predetermined high hardness rating,

a core portion having a predetermined low hardness rating,

said first and second flat skin portions disposed in sandwiching relation to said core portion and formed integrally therewith,

said first and second flat skin portions having a thickness substantially less than the thickness of said core portion,

said first and second flat skin portions having a diameter greater than the diameter of a container to be tested for leaks,

said first or second flat skin portions adapted to be disposed in abutting relation to the open end of an uncapped container to be tested for leaks so that gaseous fluid attempting to escape said container will be constrained, by said first or second flat skin portions, to accomplish said escape through a defect in said container adjacent its open end.

4,519,619

HIGH TEMPERATURE RESISTANT GASKET HAVING IMPROVED RECOVERY CHARACTERISTICS

William D. Doyle, Elmhurst, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Sep. 25, 1984, Ser. No. 654,229

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—235 B **15 Claims**

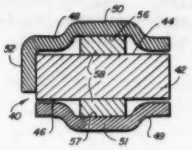
1. A gasket of improved compressibility and recovery characteristics comprising

a central annular core having upper and lower generally flat face portions,

a first annular sheet member having an upwardly projecting annular embossment defining a concave recess facing said upper flat face portion,

a second annular sheet member having a downwardly projecting annular embossment defining a concave recess facing said lower flat face portion,

means securing said first and second sheet members to said core, and



high temperature resistant filler material of relatively high recovery characteristics in each of said recesses and trapped in said recesses in confronting relation to said respective flat face portions.

4,519,620

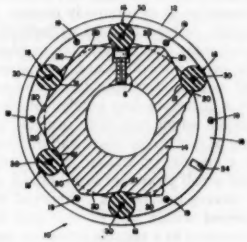
CORE CHUCK WITH RESILIENT ROLLERS

Robert D. Keith, Bridgewater, Mass., assignor to Double-E Company Inc., Brockton, Mass.

Filed Mar. 16, 1983, Ser. No. 475,900

Int. Cl.³ B23B *31/40*

U.S. Cl. 279—2 R **16 Claims**



1. A torque-transmitting chuck comprising

an interior member having a longitudinal axis and a plurality of exterior circumferentially-spaced, longitudinally-extending camming surfaces, and,

a plurality of generally axially-extending, circular in cross-section rollers each of which engages one of said camming surfaces,

said rollers being arranged to engage the interior of a hollow core into which said chuck may be inserted and to move radially outwardly relative to the interior member and into engagement with the interior of said core in response to movement of said rollers circumferentially relative to said interior member,

said chuck being characterized in that each of said rollers includes a center rod extending axially the length of said roller and an axially-extending annular layer of elastomeric material circumferentially surrounding said rod and defining the surface of said roller that engages a said camming surface and is arranged to engage the interior of said core,

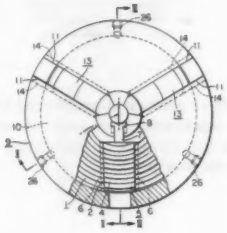
said layer having a hardness of not less than in the range of about 30 to about 90 durometer and a radial thickness of not less than about ¼ inch.

4,519,621

CHUCK FOR A MACHINE TOOL

Norifumi Okamoto, Fukui, Japan, assignor to Okamoto Seiki Kogyo Kabushiki Kaisha, Fukui, Japan

Filed Dec. 7, 1982, Ser. No. 447,641
Claims priority, application Japan, Dec. 12, 1981, 56-200593
Int. Cl.³ B23B *31/16*
U.S. Cl. 279—116 **8 Claims**



1. A chuck for a machine tool comprising a scroll board of generally a cylindrical main body having a concentric bore therein with a scroll groove being formed on one end surface thereof and having a number of radial slots formed through said cylindrical main body so as to open in said end surface, a corresponding number of slider blocks each radially movably received within each of said radial slots and having a number of arcuate grooves on the exposed surface so as to be in communication with said scroll groove of said scroll board, each said slider block being provided on the radially inner end with a radial elongation which is formed on the radial inner end with an engaging element, a cup-shaped cover board having a cylindrical body and an annular cover plate closing one of open ends thereof so as to rotatively receive said scroll board within the space defined by said cylindrical body and said cover plate, whereby said annular cover plate confronts said scroll groove of said scroll board, said annular cover plate being formed with a corresponding number of radial slots therethrough, a corresponding number of claws each radially movably received within said slots, respectively, of said annular cover plate of said cover board and provided on the under surface with a number of arcuate projections so as to be in mesh with said scroll groove of scroll board, and a manipulating member having generally a cylindrical form and axially movably received within said bore of said scroll board and adapted to be moved by a suitable actuating means, said manipulating member being formed on its outer periphery with a corresponding number of engaging means each adapted to cooperate with said each of engaging elements of said slider blocks so as to move them radially when said manipulating member is moved axially.

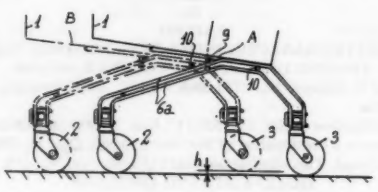
4,519,622

CARRIER TROLLEY, ESPECIALLY FOR CUSTOMERS OF SELF-SERVICE STORES

Marc Levy-Joseph, Strasbourg, France, assignor to Ateliers Reunis, Schiltigheim, France

Filed Dec. 1, 1983, Ser. No. 556,903
Claims priority, application France, Dec. 2, 1982, 82 20184
Int. Cl.³ B62B *11/00*
U.S. Cl. 280—33.99 S **3 Claims**

1. A wheeled carrier trolley, especially for customers of self-service stores, comprising a merchandise carrier basket supported by a base frame and located at a predetermined height with respect to the wheels, wherein said base frame is constituted by two elbowed side members of wire joined together by horizontal cross-members formed including one rear cross-member located near the rear edge of the bottom of said carrier basket, said side members being provided on each side with a top portion which is fixed against the underside of the bottom of the carrier basket, a sloping front portion which is inclined upwardly at an angle within the range of 10 to 20 degrees, a downwardly elbowed front end which carries the front wheels, and a downwardly directed rear portion for carrying the rear wheels, said sloping front portion being capable of nesting beneath the carrier basket of a similar trolley



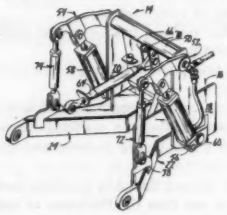
at the time of interengagement of two trolleys in order to slide against the rear cross-member of the base frame of the trolley located in front, thereby causing an upward displacement of the rear end of the front trolley at the end of the nesting movement, the rear wheels of which are lifted off the ground.

4,519,623

TRACTOR FRONT END HITCH

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed May 9, 1983, Ser. No. 492,896
Int. Cl.³ A01B *59/043*
U.S. Cl. 280—461 A **25 Claims**



1. A front end hitch for a tractor, comprising,

a main frame means removably secured to the front end of the tractor having upper and lower ends and opposite sides,

a pair of lower lift arms having rearward and forward ends, said lower lift arms being pivotally secured at their rearward ends to said main frame means at the lower end thereof and extending forwardly therefrom,

a pair of upper lift arms having rearward and forward ends, said upper lift arms being pivotally secured at their rearward ends to said main frame means and extending forwardly therefrom above said lower lift arms,

a first hydraulic cylinder means pivotally connected at one end to said main frame means at one side thereof and pivotally connected at its other end to one of said upper lift arms,

a second hydraulic cylinder means pivotally connected at one end to said main frame means at the other side thereof and pivotally connected at its other end to the other of said upper lift arms,

a first elongated member having upper and lower ends pivotally connected at its upper end to the forward end of said one upper lift arm and pivotally connected at its lower end to one of said lower lift arms,

a second elongated member having upper and lower ends pivotally connected at its upper end to the forward end of

the other upper lift arm and pivotally connected at its lower end to the other lower lift arm,

said lower lift arms comprising an outer tug arm extending forwardly and outwardly from said main frame means, an inner tug arm extending forwardly and outwardly from said main frame means, the rearward ends of said inner and outer tug arms being spaced-apart, the forward end of said inner and outer tug arms being secured together rearwardly of the forward end of said lower lift arm, said tug arms having upper and lower sides, and spaced-apart top and bottom plates secured to and extending between said inner and outer tug arms at the upper and lower sides thereof respectively, and

the forward ends of said lower lift arms being adapted for connection to the implement whereby actuation of said hydraulic cylinder means will cause the implement to be vertically moved with respect to the tractor.

4,519,624

DEVICE FOR ADJUSTING THE LONGITUDINAL POSITION OF A SAFETY BINDING FOR SKI

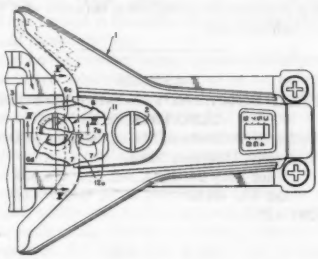
René Bressand, St-Jorioz, and Pierre Desarmaux, Pringy, both of France, assignors to Salomon S.A., Annecy, France

Filed Dec. 8, 1981, Ser. No. 328,521

Claims priority, application France, Oct. 12, 1980, 80 26213

Int. Cl.³ A63C *9/00*

U.S. Cl. 280—633 **45 Claims**



1. A device for adjusting the longitudinal position of a safety binding for a ski, comprising:

(a) a guide adapted to be fixed to said ski;

(b) a base plate adapted to be mounted for longitudinal movement in said guide; and

(c) a locking means for locking said base plate, with respect to said guide, in one of a plurality of predetermined longitudinal positions, said locking means comprising:

(i) a rotatable lock rotatable into a locked position wherein said rotatable lock cooperates with any one of a succession of lock notches spaced apart longitudinally from one another each lock notch comprising an end portion, and wherein said rotatable lock is rotatable into an unlocked position allowing said base plate to be displaced longitudinally in said guide, and wherein said lock is unbiased for movement into said locked position, wherein said lock comprises a substantially cylindrical body mounted to rotate in a housing around a vertical axis, said body having a lower face, wherein said lower face comprises a locking lug adapted to engage said lock notches; and

(ii) two stops for each predetermined longitudinal position of said binding, wherein said first stop comprises said end portion of said lock notch, wherein said first stop prevents rotation of said lock beyond a limiting position when said rotatable lock is in said locked position, and a second stop prevents rotation of said lock beyond a limiting position when said rotatable lock is in said unlocked position.

4,519,625

SKI BINDING

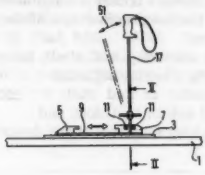
Max Luitz, Blaichach-Bihlerdorf, and Eugen Weiss, Burgberg, both of Fed. Rep. of Germany, assignors to Ess GmbH Skibindungen, Immenstadt, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,158

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1982, 3214585

Int. Cl.³ A63C *9/00, 9/22*

U.S. Cl. 280—633 **7 Claims**



1. Ski binding having a toe unit and a heel unit of which at least one is guided slidably in the lengthwise ski direction upon a mounting attached to the ski and is latchable in several slide positions by means of a latching arrangement having a movable latching bracket portion which resiliently engages an opposing bracket of the mounting, the latching bracket portion capable of being disengaged from the opposing bracket by means of an actuating member which is accessible from outside the mounting, characterized in that the toe unit and the heel unit are connected together into a common assembly slidable upon the mounting attached to the ski lengthwise in the ski direction; that the mounting has at least one insertion aperture accessible from above for the point of a ski pole; that one of the units has spaced above the insertion aperture two bearng surfaces for the ski pole in the form of leg surfaces facing each other and extending transversely to the lengthwise direction of the ski to form a generally U-shaped recess open laterally of the unit when viewed from the top which permit a tilting movement of a ski pole, inserted with its point into the insertion aperture, about an axis parallel to the lengthwise ski direction; and that the actuating member has a bearing surface in the insertion-and/or tilt path of the ski pole which is capable of being displaced transverse to the lengthwise direction of the ski by means of the ski pole.

4,519,626

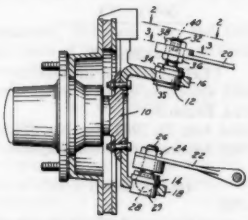
ADJUSTABLE MOUNTING FOR STEERABLE WHEELS

Richard D. Murphy, Birmingham, Mich., and Marvin N. Sokulsky, Windsor, Canada, assignors to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 215,473, Dec. 11, 1980, abandoned. This application Apr. 26, 1983, Ser. No. 487,235

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **1 Claim**



1. An adjustable mounting assembly for a steerable vehicle wheel assembly comprising:

(i) a control arm;

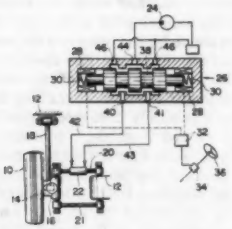
(ii) a spindle member on which a wheel is mountable and including a spindle arm;
(iii) a ball joint comprising:
(a) a ball portion;
(b) a socket portion attached to one of said control or spindle arms and receiving said ball portion; and
(c) a plate rigidly secured to said ball portion and having a plurality of studs extending therefrom in a direction opposing said ball portion;
(iv) a plurality of slots in the other of said control or spindle arms with:
(a) said slots having a common longitudinal axis generally parallel to the longitudinal axis of the arm containing said slots; and
(b) said slots receiving said studs extending from said plate, thereby allowing adjustment of the camber of said spindle member as said studs are moved along said longitudinal axis of said slots; and
(v) means for locking said studs at any desired location along said slots.

4,519,627

AUTOMATIVE COMPLIANCE STEERING CONTROL SUPENSION

Yasuji Shibahata; Namio Irie, both of Yokohama; Kazuo Ikawa, Tokorozawa, and Yohsuke Akatsu, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jun. 6, 1983, Ser. No. 501,077
Claims priority, application Japan, Jun. 7, 1982, 57-97367
Int. Cl.³ B60G *21/00*; B62D *9/00*
U.S. Cl. 280—701 **12 Claims**



1. In a suspension for a vehicle having a chassis and a road wheel, comprising:
a first link operatively interconnecting said road wheel and said chassis, said first link extending from a location forward of the axis of rotation of said road wheel in a direction essentially toward said axis;
a second link operatively connecting said road wheel to said chassis, said second link extending from a location inboard of said road wheel toward said road wheel; and
a control arrangement associated with said second link for varying the length thereof in response to a sensed parameter.

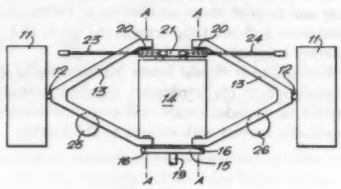
4,519,628

VEHICLE SUSPENSIONS

James N. Randle, Coventry, England, assignor to Austin Rover Group Limited, England

Filed Aug. 19, 1983, Ser. No. 524,568
Claims priority, application United Kingdom, Aug. 21, 1982, 8224126
Int. Cl.³ B60G *3/00*
U.S. Cl. 280—701 **14 Claims**

1. In a suspension for a road wheel of a vheicle:
a generally vertically extending link; 'a pivotal mounting for said link about an axis transverse of the vehicle whereby said link can move pivotally in a longitudinal direction but is constrained against lateral movement, said pivotal mounting including means for attachment to a vehicle body;
a wishbone;
a first inner mounting for said wishbone pivotally connecting said wishbone to said link at a position offset from said transverse axis;
a second inner mounting for said wishbone offset longitudinally from said first inner mounting and providing longitudinal compliance between said wishbone and said vehicle body;



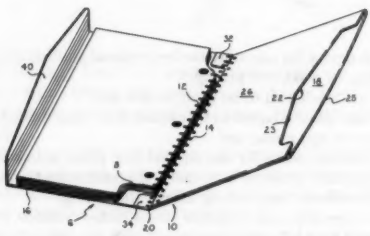
a mounting for said road wheel on an outer end of said wishbone;
said first and second inner mountings providing a longitudinal pivot axis for said wishbone whereby said road wheel is guided for generally vertical suspension movements, said longitudinally spaced inner mountings resisting inadvertent steering effects of the suspension and the compliance associated with the said second inner mounting providing longitudinal compliance between said road wheel and a vehicle body.

4,519,629

SPIRAL BOUND NOTEBOOK AND FOLDER CONSTRUCTION

Edward Podosek, Wilbraham, Mass., assignor to Dennison National Company, Holyoke, Mass.

Filed May 26, 1983, Ser. No. 498,533
Int. Cl.³ B42D *1/04, 3/18*; B42C *7/00*
U.S. Cl. 281—25 A **2 Claims**

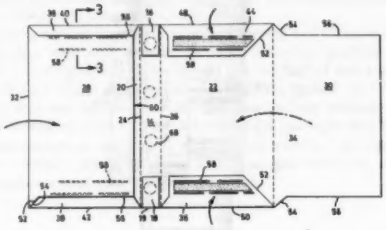


1. Spiral bound notebook comprising a cover formed of a blank of unitary sheet material having a front cover panel and a back cover panel, said cover panels being interconnected at their inner edges by a hinge line, at least one other panel pivotable about a fold line normal to said hinge line into superposed relation over a portion of at least one of said cover panels which is adjacent said hinge, means for securing the edge of said other panel opposite its fold line, a series of closely spaced perforations being formed in alignment along each side of said hinge, a binder wire disposed in helical configuration in said perforations, at least some of said perforations extending through the superposed portion of said one cover panel and said other panel to form a storage pocket in said notebook, the helical wire defining the inner portion of said pocket and adapted to bind a perforated pad of paper within said notebook.

4,519,630
BOOK COVER

Gordon W. Holmes, Mississauga, Canada, assignor to Professional Packaging Limited, Mississauga, Canada

Filed Apr. 16, 1982, Ser. No. 368,890
Int. Cl.³ B42D 3/00, 3/04
U.S. Cl. 281—31 6 Claims



1. A book binder, comprising:

an elongate spine member having two longitudinal side edges and two cover members integrally joined to said spine member,

said integral join between said spine member and one of said cover members being effected by a first fold line formed at one of said longitudinal side edges of said spine member and said integral join between said spine member and the other of said cover members being effected by a second fold line formed at the other of said longitudinal side edges of said spine member,

each said cover member being formed of overlying layers of paperboard which are joined so as to define a pocket therebetween which is open to receive a book cover at an edge of the pocket adjacent the fold line join of the respective cover member to the spine member and which is enclosed at the other three edges by folded-over paperboard,

each said cover member having discontinuous embossings formed within said pocket to space said overlying layers from each other, thereby to assist in insertion of a book cover into the respective pocket and to permit ready sliding of the book cover in the respective pocket.

6. A blank for a book binder, comprising:

a central elongate panel having tabs integrally joined to the lateral ends thereof through first and second crease lines,

first and second rectangular panels joined at one longitudinal side edge thereof one to each longitudinal side edge of said central elongate panel through third and fourth crease lines,

third generally rectangular panel joined at one longitudinal side edge thereof to the first rectangular panel at the other longitudinal side edge thereof through fifth crease line,

fourth generally rectangular panel joined at one longitudinal side edge thereof to the second rectangular panel at the other longitudinal side edge thereof through sixth crease line,

first and second wing panels joined one to each of the lateral side edges of the first rectangular panel through seventh and eighth crease lines, and

third and fourth wing panels joined one to each of the lateral side edges of the second rectangular panel through ninth and tenth crease lines,

said first, seventh and ninth crease lines being in straight line alignment and said second, eighth and tenth crease lines being in straight line alignment,

each said wing panel having embossings extending laterally thereof,

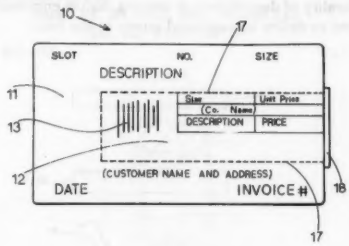
each said wing panel having a side edge extending angularly at an approximate angle of 45° from the free lateral edge thereof to the point of join of the crease line joining the wing panel to the respective rectangular panel and the crease line joining the respective rectangular panel and generally rectangular panel,

each said generally rectangular panel including an angularly directed edge in straight line alignment with said angular side edge of said wing panel extending from said point of join to the respective lateral side edge of said generally rectangular panel.

4,519,631
SYSTEM FOR PROVIDING UPDATED PRODUCT AND PRICING INFORMATION FOR RETAILER

Joel R. Stone, and Gary H. Stone, both of 2141 Upper St. Dennis, both of St. Paul, Minn. 55116

Filed Jan. 6, 1983, Ser. No. 455,918
Int. Cl.³ B42D 15/00
U.S. Cl. 283—70 3 Claims



1. A method for providing product information and consumer pricing information on goods shipped by a supplier to a retailer for retail sale from store shelves, comprising the steps of:

the supplier placing computer generated retailer product information indicia on the face of a first section of a paper label, said product information including identification of the product, number of units of product, unit price and address of retailer;

the supplier also placing consumer intelligible pricing indicia on the face of an attached but separable section of said label;

the supplier attaching said marked label to a shipping container in which products are shipped by the supplier to the retailer with only the first section of said label fixedly attached to the shipping container; and

then the retailer detaching the separable label section from the first section of the label and placing the separated section on the display shelf for providing intelligible pricing information for the consumer when the retailer removes the products from the shipping container and places them on a display shelf for sale to the consumer.

4,519,632
IDENTIFICATION CARD WITH HEAT REACTIVE COATING

Dean B. Parkinson, Redwood City, and Orton D. Bergren, Menlo Park, both of Calif., assignors to Computer Identification Systems, Inc., Sacramento, Calif.

Filed Mar. 19, 1982, Ser. No. 359,961
Int. Cl.³ B42F 15/00
U.S. Cl. 283—75 15 Claims

1. A method for making an identification card having a base and a color-changeable layer comprising the steps of:

providing a planar base made of a first compound and having a first color;

preparing a dispersion by intermixing:

a color-changeable heteropolymolbdate pigment;

a resin;

a plasticizer for modifying the first compound to enable bonding of the resin and the pigment thereto; and

a non-aqueous solvent in which both the resin and the first compound of the base are soluble;

engraving the base to form a plurality of engraved depressions; .

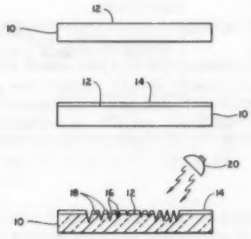
applying the dispersion to the non-engraved surface regions of the base adjacent to the engraved depression;

allowing the solvent to evaporate to form the color-changeable layer having a second color bonded to the non-engraved surface regions of the base adjacent to the engraved depression; and

heating the color-changeable layer to change the second color to a third color to generate an image defined by the contrast in color between the engraved regions having the first color and the color-changeable layer on the non-engraved surface regions of the base.

8. A multilayered identification card comprising:

a base layer having a first color, the base layer having a plurality of depressions of varying depths engraved thereunto to define an engraved image in the base;



a color-changeable layer disposed on and bonded to selected regions of the base layer, the color-changeable layer initially having a second color changeable to a third color contrasting with the first color upon heating to a first temperature for a specified period of time;

the color-changeable layer applied to the base layer as a liquid dispersion including a vinyl copolymer, a cross-linkable plasticizer reactive with the base layer to allow cross-linking of the resin thereto, a cross-linking agent for actuating said cross-linking, a heat-sensitive coloring agent capable of coloring the color-changeable layer in the absence of a co-reactant to change from the second to the third color when subjected to heating, and a non-aqueous solvent in which both the base layer and the vinyl copolymer are soluble; whereby the plasticizer and the cross-linking agent are selected to react with the base layer to effect molecular cross-linking between the color-changeable layer and the base layer for said bonding.

4,519,633

SUBSEA WELL CASING TIEBACK CONNECTOR

Randy P. Nichols, Humble, Tex., assignor to FMC Corporation, Chicago, Ill.

Filed Jun. 29, 1983, Ser. No. 509,127
Int. Cl.³ F16L *37/08*
U.S. Cl. 285—3 **16 Claims**

1. A pipe connector especially useful for tying back to a subsea wellhead with a casing riser, said connector comprising:

a. a tubular tieback sub;

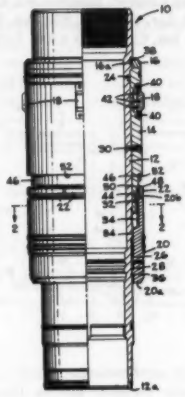
b. a sleeve-like collar surrounding the sub;

c. anti-rotation means for releasably securing the collar to a receptacle in which the connector is installed;

d. an actuator nut surrounding the sub;

e. means interconnecting the sub and the nut to facilitate relative axial movement between said sub and nut in response to rotation of said sub with respect to said nut;

f. means interconnecting the collar and the nut to facilitate relative axial movement and prevent relative rotational movement therebetween; and



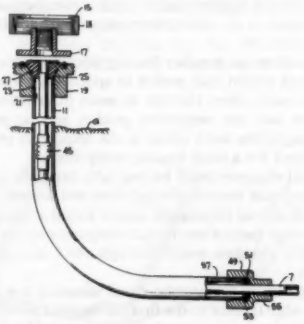
g. lock ring means surrounding the collar and expandable from a contracted condition by axial movement of the collar with respect to said nut.

4,519,634

TRANSITION PIPE FITTING

James D. Hand, Rte. #2, Box 29-C, Crestview, Fla. 32536

Filed Dec. 22, 1982, Ser. No. 452,315
Int. Cl.³ F16L *39/00*
U.S. Cl. 285—55 **9 Claims**



1. A transition pipe fitting assembly for interconnecting a pliant gas conduit to a gas meter riser having gas flowing therethrough in a downstream direction, wherein said assembly comprises:

a first half of a standard pipe union serving as a coupling sleeve having an annular threaded shoulder portion extending radially outwardly therefrom, a threaded bore formed therein for threaded engagement with a downstream end portion of said gas meter riser, a recess formed in a downstream surface portion of said coupling sleeve concentric with said threaded bore so as to form a passage through said coupling sleeve, and an annular groove formed in said downstream surface portion of said coupling sleeve radially outwardly from and coaxial with said recess;

a compression seal disposed within said recess and having an axial channel formed therethrough;

an O-ring seal disposed within said annular groove;

a rigid pipe having a downstream end portion thereof inserted within said axial channel formed through said compression seal;

a flat washer concentrically secured to said downstream end portion of said rigid pipe for resisting withdrawal of said rigid pipe from said axial channel formed through said compression seal such that said flat washer abuts a downstream surface portion of said compression seal;

a second half of said standard pipe union operatively associated with said coupling sleeve; and

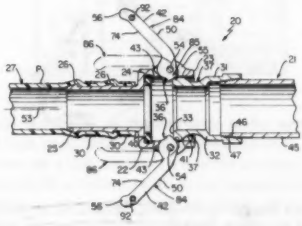
a coupling nut having threads formed therein and threadedly engaged with said annular threaded shoulder portion of said coupling sleeve to force said second half of said standard pipe union against said flat washer, against said O-ring seal and against said downstream surface portion of said coupling sleeve so as to form a first gas tight seal via compression of said O-ring and to form a second gas tight seal radially inwardly from said first gas tight seal via compression of said compression seal.

4,519,635

QUICK CONNECT-DISCONNECT COUPLING

Jack A. McMath, Fort Thomas, Ky., assignor to Dover Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 428,164
Int. Cl.³ F16L *35/00*
U.S. Cl. 285—93 **24 Claims**



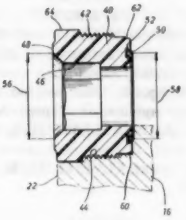
1. In a quick connect-disconnect coupling for fluid conduit means comprising, a coupler member adapted to be connected in said conduit means and having a first tubular outer end and a first sealing surface, an adapter member adapted to be connected in said conduit means and having a second tubular outer end and a second sealing surface, said second tubular end being adapted to be received within said first tubular end, cam means for connecting and disconnecting said members comprising first cam means carried by said first tubular end and second cam means carried by said second tubular end, and seal means disposed between said sealing surfaces for providing a fluid-tight seal between said members with said first and second cam means connected and with said members being in a first axial position thereof, said first and second cam means respectively having cam surfaces, one of said first and second cam means being movable relative to its respective tubular outer end in one direction of continuous opening movement thereof from a fully connected position of its said cam surface with said cam surface of the other of said first and second cam means with said members in said first axial position thereof to a fully disconnected position of said cam surfaces so that said members can be completely disconnected from each other, the improvement in which said cam surfaces of said first and second cam means act against each other during disconnection of said members as said one cam means is being continuously moved through said opening movement thereof to provide an axial disconnecting movement of said members from said first axial position thereof until a particular second axial position is reached at which second axial position the disconnecting movement of said members is reversed and becomes an incremental axial connecting movement for a predetermined increment to a third axial position of said members before allowing said members to be completely disconnected whereby in the event fluid under pressure is present in said conduit means having said members connected therein said incremental connecting movement of said members is subjected to resistance by said fluid under pressure, said resistance being transmitted through said members as an opposing force which serves to impede said incremental movement by resisting any opening force applied to said one cam means, said opposing force being detectable and once detected serves as a warning that the pressure of said fluid under pressure must be relieved before completely disconnecting said members.

4,519,636

SEAL FOR AN UNDERWATER CONNECTOR

Jerry B. Tomlin, Sugar Land; Gustave S. Levey, Houston, and Michael A. O'Neil, Dallas, all of Tex., assignors to Koomey, Inc., Brookshire, Tex.

Filed Oct. 20, 1982, Ser. No. 435,512
Int. Cl.³ F16L *33/16*
U.S. Cl. 285—95 **12 Claims**



1. In an underwater connector for interconnecting a plurality of fluid lines having first and second mating members, each member having a coacting mating surface with a plurality of fluid passageways for mating with the passageways of the other member, the improvement in seal means on the mating surface of one of the members for sealing between mating passageways of said members comprising,

said passageways of said one member having threads,

an annular resilient seal having a thread and threadably connected in each of the threaded passageways on said one member,

said annular resilient seal having a bore therethrough,

said seal including a raised sealing surface on its outer end for mating with the other member,

said seal including a raised fluid sealing surface on its inner end for sealing with said one member,

the center of the sealing surface on the outer end having a diameter at least as great as the diameter of the center of the sealing surface on the inner end whereby the fluid pressure in the passageways acts on the seals to prevent the fluid pressure from expelling the seals from said one member.

4,519,637

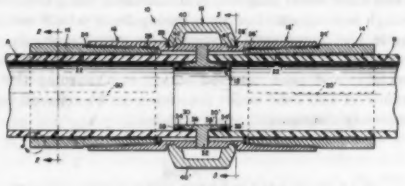
PIPE COUPLING

Joie L. Folkers, Wichita Falls, Tex., assignor to Ameron Inc., Monterey Park, Calif.

Filed Sep. 28, 1982, Ser. No. 425,709
Int. Cl.³ F16L *17/00*
U.S. Cl. 285—113 **10 Claims**

1. A pipe coupling comprising first and second sleeve means adapted to be secured around respective end portions of a pair of pipe sections to be coupled, sealing means for providing fluid seals around the interior surfaces of the respective pipe sections, and clamp means for holding the sleeve means together, wherein each of the sleeve means includes an axially slit inner sleeve with an external tapered thread and an outer

sleeve with an internal tapered thread complementary to the external thread on the inner sleeve, the inner sleeve having internal teeth adapted to grip the surface of a respective pipe



section for securing the inner sleeve thereto when the outer sleeve is threaded onto the inner sleeve, and wherein the clamp means and outer sleeves have cooperable portions for resisting separation of the respective sleeve means and pipe sections.

4,519,638

PIPE JOINT

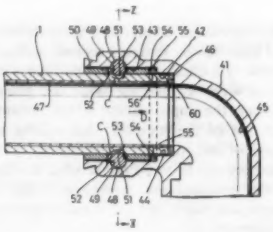
Tatsuo Yodoshi; Hiroyoshi Ohata, and Hiroshi Inoue, all of Kawachinagano, Japan, assignors to Higashio Pipe Fittings Mfg. Co., Ltd., Osaka, Japan

Filed Sep. 30, 1982, Ser. No. 428,720

Claims priority, application Japan, Mar. 19, 1982, 57-39631[U]; Apr. 15, 1982, 57-55417[U]; Jun. 25, 1982, 57-96102[U]

Int. Cl.³ F16L *37/00*

U.S. Cl. 285—305 **5 Claims**



1. A pipe joint comprising, in combination with a pipe to be joined,:

a joint body provided with a pipe insertion bore, said pipe insertion bore having a large diameter portion open at one end to the outside of said joint body and having a diameter greater than the outer diameter of said pipe to be joined, and a small diameter portion inwardly of said large diameter portion communicating with a connecting bore of said joint body and having a diameter equal to the outer diameter of said pipe to be joined, a first annular step being formed between said large and small diameter portions, and a second annular step being formed between said small diameter portion and said connecting bore;

a hollow cylindrical body defined by cylindrical walls provided with means to allow communication through said walls and having an inner diameter equal to the diameter of said small diameter portion of said pipe insertion bore, inserted in said large diameter portion of said pipe insertion bore so as to define an annular groove between an inner end of said hollow cylindrical body and said first annular step;

an annular resilient sealing member interposed in said annular groove for tightly sealing between said pipe insertion bore and an outer periphery of said pipe to be joined when said pipe is joined therein;

annular packing means disposed in said small diameter portion of said pipe insertion bore between said second annular step and a distal end of said pipe to be joined when said pipe is inserted in said pipe insertion bore;

at least one fixing hole formed in said joint body tangentially of said large diameter portion of said pipe insertion bore, an inner side portion of said fixing hole opening into said large diameter portion; and

screw means adapted to engage with said fixing hole and to pass through said means in said wall to form recesses in an outer periphery of said pipe to be joined,

whereby said pipe to be joined may be inserted through said inner diameter of said hollow cylindrical body and into said small diameter portion of said pipe insertion bore and said screw means engaged in said fixing hole, means in said wall and said recesses thereby formed in said pipe in order to join said pipe to said joint body.

4,519,639

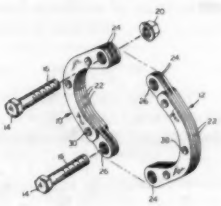
HINGED FLANGE FOR TAILPIPES AND THE LIKE

Roy S. Florian, Southington, Conn., assignor to Nickson Industries, Inc., Plainville, Conn.

Filed Jul. 1, 1983, Ser. No. 510,434

Int. Cl.³ F16L *23/00*

U.S. Cl. 285—415 **3 Claims**



1. A split flange for coupling flanged elements of an exhaust system or the like comprising:

a. a pair of laminated clamp members of generally arcuate configuration and each including at least five similarly configured and dimensioned sheet metal arcuate segments disposed in overlying relationship to provide a laminate comprised of at least five sheet metal laminae, alternating segments being arcuately displaced relative to the adjacent segments so as to project beyond one end of the adjacent segments and terminate inwardly from the end of the other end of the adjacent segments which project therebeyond to provide end portions comprised of at least two of said segments at each end of said clamp member, and a plurality of fastener means spaced along the length of said sheet metal segments between said end portions and securing the overlying segments in assembly, the pair of clamp members being disposed with the arcs circumscribed thereby disposed in opposition and with the laminae of the end portions of said clamp members interfitting to provide at least five interfitting segments, said end portions of said segments being of enlarged width relative to the center thereof, said interfitting end portions of each of said clamp members having aligned apertures therein spaced inwardly from the ends of the projecting end portions of the segments providing such end portions of the clamp members and outwardly from the ends of the other segments, the configuration and dimensioning of said end portions of said segments and the spacing of said apertures therein permitting pivoting of said clamp members relative to each other about the axis of said aligned apertures; and a pair of fastening means seated in said aligned apertures of said clamp members to secure the clamp members in assembly circumscribing a generally circular space, at least one of said fastening means being

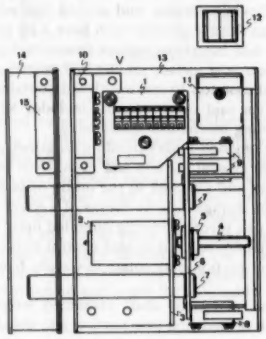
releasably engageable and removable to permit the clamp members to pivot about the other of said fastening means.

4,519,640

ELECTRONICALLY MOTORIZED LOCK WHOSE MOTOR SHAFT IS PARALLEL TO THE LONGITUDINAL AXIS OF THE BOLTS

Paup Mombelli, Nice, France, assignor to I.C.B. France Industrie et Componsants du Batiment Société Anonyme, Yzeure, France

Filed Sep. 29, 1982, Ser. No. 432,103
Claims priority, application France, Oct. 7, 1981, 81 19276
Int. Cl.³ E05B *47/00*; E05C *1/06*
U.S. Cl. 292—33 **6 Claims**



1. An electronically motorized lock to be mounted on a door, said lock comprising, integrated in the lock, mechanical safety means, an electric motor, a control module, bolt means movable between a locking position and an unlocking position the mechanical safety means comprising an arrangement wherein the motor has an output shaft which is parallel to a longitudinal axis of the bolt means, along which axis the bolt means are movable, means for connecting the motor to the bolt means for shifting the bolt means between the unlocking position and the locking position, the bolt means comprising a plurality of bolts and the mechanical safety means comprising a U-shaped element defining apertures in branches of the U-shaped element, the bolts being guided in said apertures and a driving member which is part of said connecting means being drivingly engaged with the bolts, switch means for communicating the position of the bolt means, and detecting means for detecting an open or closed state of the door and for detecting impacts received by the door, and wherein the motor is a low-tension DC motor having an output shaft and is fixed to an inner wall of a U-shaped element which is rigid with a plate carrying all of the components of the lock, a lead-screw being secured to said output shaft, and a nut being screwthreadedly engaged with the lead-screw and being prevented from rotating by a driving member which drivingly engages the bolt means.

4,519,641

DOOR OPENING-CLOSING APPARATUS FOR LARGE-SIZED REFRIGERATOR OR THE LIKE

Toshimichi Fujiya, No. 4-22, Kounandai 6-chome, Kounan-ku, Yokohama-shi, Kanagawa-ken, Japan

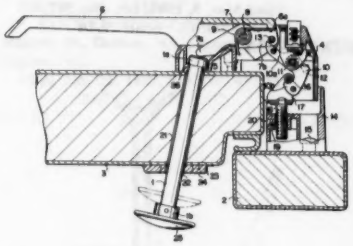
Filed Mar. 2, 1983, Ser. No. 471,258
Int. Cl.³ E05C *19/12*
U.S. Cl. 292—127 **6 Claims**

1. A door opening-closing apparatus for large-sized compartments said apparatus comprising:

a grip seat adapted to be secured to a door; a grip and an actuating lever which are mutually pivotable about a pivot pin attached to said grip seat;

a latch support seat adapted to be secured to a side pillar of the compartment;

a push rod adapted for penetrating a door from inside to outside, the outer end of said push rod being brought into contact with one end of said actuating lever; and



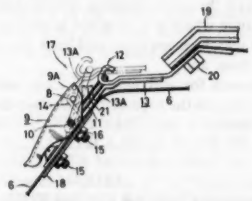
a latch pivotably attached to said grip seat, one end of said latch being contacted by the other end of said actuating lever, whereby pivoting said actuating lever by pushing against the inner end of said push rod will undo the engagement between said latch support secured to the side pillar of the compartment and the other end of said latch, said push rod being inclined with respect to the door so as to be more remote from the side pillar as the rod extends from said outer end to said inner end thereof.

4,519,642

LOCKING DEVICE

Elichi Hamada, and Kouzou Hamada, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Aug. 16, 1983, Ser. No. 523,710
Claims priority, application Japan, Oct. 12, 1982, 57-154258[U]
Int. Cl.³ E05C *5/04*
U.S. Cl. 292—247 **16 Claims**



1. A locking device comprising a handle rotatably supported on a body through a support shaft, a catch hook rotatably supported by said handle through a rotary shaft, and a hook secured to a counterpart member to be fastened to or detached from said body and engageable with said catch hook at the time of locking, said rotary shaft for rotatably supporting the catch hook on the handle being provided at a position closer to the body than a straight line passing through the support shaft and a portion of engagement between the catch hook and the hook when the handle approaches the body to take a locking position, and the counterpart member being locked against the body through the catch hook through a turnover action of the catch hook, said action occurring when the handle rotates, wherein a retainer is secured to the hook to be projected to a position close to an opposite side portion of the handle during locking, said opposite side portion being substantially opposite to the rotary shaft with the support shaft interposed therebetween and including the support shaft, and to be disposed at a position where the retainer abuts against the opposite side

portion when the hook together with the counterpart member move relative to the handle in a direction of the handle.

4,519,643

HANDLE FOR EXTENDING THE REACH OF A ROPE

Warren R. Harris, 1960 Dolphin Blvd. S., St. Petersburg, Fla. 33707

Filed Mar. 9, 1984, Ser. No. 587,908
Int. Cl.³ B63B *21/04*
U.S. Cl. 294—19.1 **6 Claims**

1. A device for enlarging a rope loop and extending it a substantial distance from the holder to encircle an object comprising:

(a) a first tube having a Y or T shaped separator tubular yoke attached to one end thereof;

(b) a second tube having a diameter smaller than the exterior diameter of said first tube and adapted to fit into said first tube;

(c) a rope extending into said second tube while said second tube is inserted inside said first tube, and passing into said separator yoke with the end of said rope passed through one opening of said separator yoke, looped to pass through the other opening of said yoke and into the said first tube where it is attached to said rope to complete the loop which passes from and back into the interior of said first tube; and

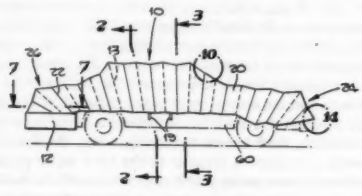
(d) a means for stiffening said loop, said stiffening means extending in the rope no further than the length of the said first tube.

4,519,644

FOLDABLE VEHICLE COVER STORABLE ON THE VEHICLE

Sung T. Song, 1911 Gardena Ave., Glendale, Calif. 91204

Filed Jun. 22, 1983, Ser. No. 506,640
Int. Cl.³ B60J *11/00*
U.S. Cl. 296—136 **1 Claim**



1. A vehicle cover unfoldably deployable and foldably storable, comprising:

a plurality of rigid C-frame members having top and bottom ends;

a storage case for containing said C-frame members, said storage case being C-shaped and comprising:

an outermost surface having a bottom portion;

a case top for covering the top of said outermost surface wherein said case top is C-shaped, comprising:

a central portion;

a first side portion;

a first flexible portion joining said central portion and said first side portion;

a second side portion;

a second flexible portion joining said central portion and said second side portion;

wherein said central portion, said first side portion, said first flexible portion, said second side portion and said second flexible portion each have a lip portion that fits over said outermost surface in an overlapping manner;

an innermost surface joining said outermost surface and said case top to make a closed container;

wherein said case top also includes an opening and closing mechanism comprising:

a first elongated shaft extending lengthwise of the length of said central portion and distal from said lip portion thereof and attached to the inside of said inner surface of said storage case by means of a fixed bearing block;

at least one pivoted bearing mounted upon said first shaft and fixedly secured to said central portion so that said central portion may rotate upwardly from said storage case;

a second elongated shaft extending lengthwise of the length of said first side portion and distal from said lip portion thereof and attached to the inside of said innermost surface of said storage case by means of a fixed bearing block;

at least one pivoted bearing mounted upon said second shaft and fixedly secured to said first side portion so that said first side portion may rotate upwardly from said storage case;

a third elongated shaft extending lengthwise of the length of said second side portion and distal from said lip portion thereof and attached to the inside of said innermost surface of said storage case by means of a fixed bearing block;

at least one pivoted bearing mounted upon said third shaft and fixedly secured to said second side portion so that said second side portion may rotate upwardly from said storage case;

a bevel gear at each end of said first elongated shaft;

a meshing bevel gear at the appropriate end of said second elongated shaft meshing with the bevel gear at one end of said first elongated shaft;

a meshing bevel gear at the appropriate end of said third elongated shaft meshing with the bevel gear at the other end of said first elongated shaft;

so that when said central portion is rotated upwardly from said storage case, the interaction of the meshing bevel gears constrains said first side portion and said second side portion to rotate upwardly from said storage case and said first flexible portion and said second flexible portion to flex so as to permit such motion;

a plurality of fold arms;

a first plurality of hinges connecting said ends to said fold arms;

a plurality of bottom fold arms;

a second plurality of hinges connecting said bottom ends to said bottom fold arms;

a plurality of C-shaped elastomeric tensioning members;

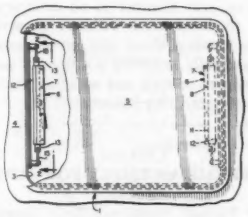
covering fabric alternately attached to said plurality of rigid C-frame members and said plurality of C-shaped elastomeric tensioning members so as to form panels therebetween.

4,519,645

VEHICLE ESCAPE HATCH AND VENTILATOR

Timothy A. Kelly, and Rueben M. Turbyfill, both of Salem, Va., assignors to Ventilator Associates, Salem, Va.

Filed Aug. 1, 1983, Ser. No. 518,960
Int. Cl.³ B60J 7/10
U.S. Cl. 296—224 6 Claims



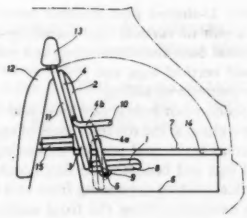
1. A combined escape hatch and ventilator for a vehicle roof, comprising a frame bounding an opening in the roof, a cover for opening and closing said opening, hinge means connecting said cover to opposite sides of said frame normally for limited opening movement relative to at least one of said sides, said hinge means at said one side being formed of separable interfittable cover and frame parts, lug means on one of said parts, latch means pivotally mounted on the other part, and cam means on said latch means and engageable with said lug means on interfitting of said parts for releasably interlocking said parts.

4,519,646

REARWARD FACING COLLAPSIBLE VEHICLE BACK SEAT

Wulf Leitermann, Bad Wimpfen, and Rolf Heneka, Bad Friedrichshall, both of Fed. Rep. of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Fed. Rep. of Germany

Filed Nov. 24, 1982, Ser. No. 444,450
Claims priority, application Fed. Rep. of Germany, Dec. 2, 1981, 3147656
Int. Cl.³ B60N 1/02
U.S. Cl. 297—15 7 Claims



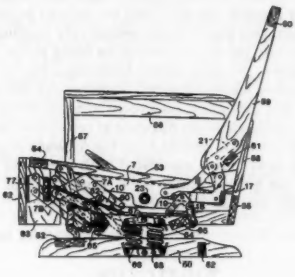
1. A rear facing vehicle back seat construction including a cavity in the floor of the vehicle having side walls provided with pivot bearings on a common transverse axis, and comprising a seat section and a back section which are arranged to pivot independently from an operative position to an out-of-use position in said cavity, a generally U-shaped frame which supports said back section and has limbs extending along and beyond opposite sides of said back section and said seat section; said limbs having, as seen in the operative position, upright upper portions defining a first plane and lower portions lying in a second plane which is substantially in parallel but offset from said first plane and connected to said upper portion by a substantially horizontal portion arranged to lie roughly on a level with the elbows of an occupant of the seat, the bottom ends of said lower portions of the limbs being mounted in said pivot bearings in said cavity, said seat section also being pivotally mounted on the transverse axis between a seat center and a seat edge disposed adjacent to the back section, said seat section abutting with said edge the bottom of the back section in the operative position, said back section forming a load-carrying surface by covering said cavity in said out-of-use position.

4,519,647

ROCKER-RECLINER CHAIR

Walter C. Rogers, Jr., Denton, N.C., assignor to Parma Corporation, Denton, N.C.

Filed Jan. 11, 1983, Ser. No. 457,181
Int. Cl.³ A47C 1/02
U.S. Cl. 297—85 20 Claims



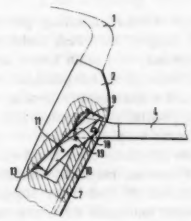
1. A rocker-recliner chair comprising in combination, a support base, a rocker cam assembly mounted on the base, a seat and armrest fixed to each other as a unitary structure, a footrest, footrest linkage means mounting the footrest to the seat for movement between retracted and extended positions, seat linkage means mounting the seat to the rocker cam assembly for movement relative to the rocker cam assembly in response to the weight of a chair occupant, linkage means interconnecting the seat linkage and the footrest linkage for driving the footrest linkage to place the footrest into extended position as the seat moves relative to the rocker cam assembly, and a release means preventing the seat from moving relative to the rocker cam assembly when the footrest is retracted.

4,519,648

ARRANGEMENT FOR ENABLING A PIVOTAL MOUNTING OF A TRAY TO A SEAT BACK OF A SEAT OF A PASSENGER MOTOR VEHICLE

Nenad Jovanovic, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke AG, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,256
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1981, 3130566
Int. Cl.³ B60N 3/00
U.S. Cl. 297—146 16 Claims



1. An arrangement for enabling a pivotal mounting and

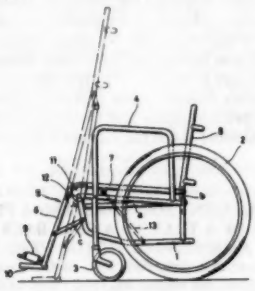
generally horizontal positioning of a tray relative to a back of a seat, the tray being operatively shiftable between a stowed position and an in-use position, the arrangement comprising a tray having a forward edge and adjustment means for enabling an effective adjustment of inclination of the tray when the tray is in the in-use position, said adjustment means including first means disposed proximate the forward edge of the tray and second means disposed on the back of the seat, the first means of the adjustment means including at least one toothed means mounted at the forward edge of the tray and the second means including a second toothed means fixedly disposed at a rear side of the back of the seat, said first and second toothed means being adapted to be brought into meshing engagement when the tray is in the in-use position, said seat back including an opening for accommodating the tray in the stowed position, said tray serving as a means for covering the opening when the tray is in the stowed position, guide means associated with said seat back for guiding the tray from the stowed position to the in-use position, said guide means operatively enabling the tray to be pivoted into the in-use position by being pulled upwardly and folded down, the guide means including a pair of vertically extending groove means provided on respective lateral sides of the opening and extending essentially over an entire length of the opening, guide elements disposed at respective lateral sides of the tray at a position spaced from the forward edge thereof, and a biased pawl means associated with the upper end of at least one of the groove means for engaging one of the guide elements when the tray is in the in-use position.

4,519,649

WHEELCHAIR

Osamu Tanaka, Sagamihara; Hiroshi Iijima, Isehara; Masayoshi Ito, Atsugi, and Etsumi Okigawa, Hadano, all of Japan, assignors to Kanagawa Rehabilitation Center, Kanagawa, Japan

Filed Mar. 28, 1983, Ser. No. 479,369
Claims priority, application Japan, Mar. 26, 1982, 57-47291
Int. Cl.³ A47C *1/02*
U.S. Cl. 297—316 **5 Claims**



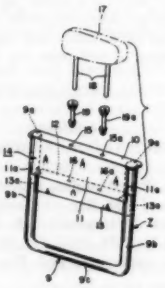
1. A wheelchair comprising:
- a main frame supporting driving wheels and auxiliary wheels;
- a body support frame including pivotally interconnected lower limb support member, waist support member and backrest member, said main frame and said body support frame being formed as independent structures, a front end portion of said waist support member of said body support frame being pivotally connected to a front end portion of said main frame by pivot means;
- a pair of elbow supports each fixed to an upper portion of said main frame at respective sides thereof, said waist support member of said body support frame being disposed between said pair of elbow supports in a seating position of said body support frame;
- a gas spring fitted, at one end thereof, to a gas spring receiver pivotally connected to said main frame, and pivotally connected at its other end by a piston rod thereof to said waist support member of said body support frame such that extension and retraction of said gas spring causes said waist support member to rotate about said pivot means with respect to said main frame; and
- locking means in operable connection with said gas spring for locking said gas spring in an arbitrary position between a fully extended and a fully retracted position so as to fix said waist support member at an arbitrary angle with respect to the horizontal within a prescribed angular range of its rotation about said pivot means, said fully extending and fully retracted positions of said gas spring corresponding to seating and standing positions of said body support frame, respectively.

4,519,650

SEAT BACK FRAME ASSEMBLY FOR AUTOMOBILE SEATS

Takami Terada; Hiroshi Nawa, and Reiki Kawamura, all of Toyota, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Toyota Jidosha Kabushiki Kaisha, both of Aichi, Japan

Filed Mar. 8, 1983, Ser. No. 473,678
Claims priority, application Japan, Mar. 9, 1982, 57-32699[U]
Int. Cl.³ A47C *7/02*
U.S. Cl. 297—452 **2 Claims**



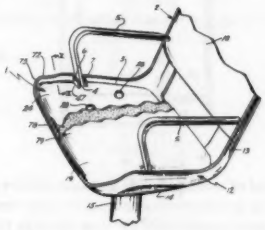
1. A seat back frame assembly for mounting a headrest, comprising:
- a substantially U-shaped pipe member having a horizontal base and a pair of vertical legs extending upwardly from the horizontal base and terminating at a pair of respective ends of said vertical legs, and
- a transverse member including:
  - first and second horizontal portions, said first horizontal portion welded at the top most ends of said vertical legs, said second horizontal portion extending between said vertical legs and beneath said first horizontal portion,
  - a first vertical portion depending from said first horizontal portion extending along the front surface of said pipe member and connecting said first and second horizontal portions,
  - a second vertical portion depending from said second horizontal portion and extending along the rear surface of said pipe member, each of the first and second vertical portions having opposite edge portions welded to the legs of said pipe member,
- said first horizontal portion having a pair of transversely spaced first apertures,
- said second horizontal portion having a pair of transversely spaced second apertures and said second apertures being aligned in the vertical direction with said pair of said first apertures, and
- a pair of receptacles, each of said receptacles being positioned within said first and second aperature allowing said headrest to be mounted on said transverse member.

4,519,651

CONVERTIBLE INNER SHELL FOR SEATING AND THE LIKE

Ronald L. Whitwam, Caledonia, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Oct. 14, 1982, Ser. No. 434,239
Int. Cl.³ A47C *7/02*
U.S. Cl. 297—455 **32 Claims**



1. A convertible inner shell for constructing both armed seats and armless seats, comprising:

a shell body having a perpheral edge with at least one notch therein shaped to form a pocket in which a portion of a seat arm is received, said notch having an open side at the peripheral edge of said shell body;

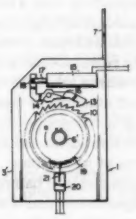
a tab hingedly connected with said shell body adjacent said notch, and being pivotal between open and closed positions; said tab being shaped to substantially close the outer side of said notch in the closed position, whereby said peripheral edge extends generally continuously and uninterrupted about said shell body for constructing armless seats, and said tab opens the outer side of said notch in the open position for constructing armed seats; said tab pivoting vertically into the open position, and forming a generally vertically oriented sidewall for said pocket, and including an outer tip with means for extending said tab outer tip outwardly of the peripheral edge of said shell body when said tab is pivoted into the open position to facilitate constructing a cushion which mates closely with the seat arm.

4,519,652

STRAP RETRACTOR ASSEMBLY

Ken Kamijo, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 11, 1983, Ser. No. 457,128
Claims priority, application Japan, Feb. 3, 1982, 57-15958
Int. Cl.³ A62B *35/00*
U.S. Cl. 297—477 **12 Claims**



1. A strap retractor assembly for use in a vehicular seat belt arrangement including an elongated flexible retaining strap to be fitted to an occupant of a seat structure in a vehicle body, comprising:

a reel shaft rotatable about an axis fixed with respect to the vehicle body and having said retaining strap anchored thereto at one end of the strap;

biasing means urging the reel shaft to turn about said axis in a direction to have the retaining strap re-wound on the reel shaft;

a ratchet wheel rotatable with the reel shaft about said axis;

a pawl member movable into and out of a position engaging the ratchet wheel and prohibiting the ratchet wheel and the reel shaft from being turned in said direction about said axis;

pulse generating means positioned in the vicinity of said ratchet wheel and operative to produce first pulses in response to rotation of the reel shaft in one direction about said axis and second pulses in response to rotation of the reel shaft in the opposite direction about said axis;

resettable pulse counting means electrically connected to said pulse generating means and operative to count said first pulses forwardly and said second pulses backwardly;

comparing means electrically connected to said pulse counting means and operative to compare the number of the pulses counted by said pulse counting means with a predetermined number of pulses and to produce a control signal when the number of the pulses counted by the counting means is in a predetermined relationship to the predetermined number of pulses; and

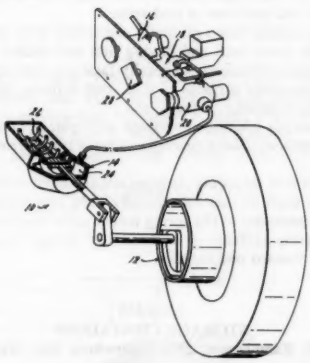
electro-magnetically operated actuating means electrically connected to said comparing means and responsive to said control signal and operative to drive said pawl member into said position in response to the control signal.

4,519,653

ANTI-THEFT LOCK DEVICE

Paul B. Smith, Ann Arbor, Mich., assignor to Davco Manufacturing Corporation, Ann Arbor, Mich.

Filed Sep. 23, 1982, Ser. No. 421,991
Int. Cl.³ B60T *17/16*; B60R *25/08*
U.S. Cl. 303—89 **8 Claims**



1. In an apparatus having an actuating member moveable between an actuating position and a de-actuating position, the improvement comprising a lock member moveable toward and away from said actuating member, biasing means for biasing said lock member toward said actuating member, said lock member non-interferringly engaging said actuating member when said actuating member is in its de-actuating position and interferringly engaging said actuating member when said actuating member is in its actuating position to prevent said actuating member from being moved to said de-actuating position, selectively energizable electric solenoid means for moving said lock member out of engagement with said actuating member to allow said actuating member to be moved from said actuating position to said de-actuating position and timing means for energizing said electric solenoid means for a predetermined

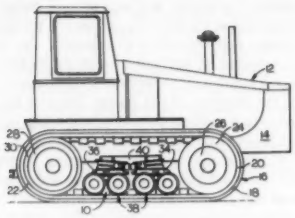
time period after said electric solenoid means is initially energized in order to hold said lock member out of engagement with said actuating member for said predetermined time period, thereby allowing said actuating member to be moved from said actuating position to said de-actuating position during said predetermined time period.

4,519,654

ROLLER SUSPENSION APPARATUS FOR A BELTED VEHICLE

Ronald L. Satzler, Princeville, and Samuel B. Stevens, Pekin, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 20, 1983, Ser. No. 563,335
Int. Cl.³ B62D *55/16*
U.S. Cl. 305—27 **11 Claims**



1. A roller suspension apparatus adapted for use on a belted vehicle having a frame comprising:

a single pivot shaft adapted to be connected to the vehicle frame;

a pair of arms each pivotally connected at one end to the pivot shaft and extending in opposite directions from the pivot shaft, each of said arms having a mounting surface at a distal end portion thereof;

a pair of roller mechanisms individually connected to the distal end portions of said arms;

a force transfer beam pivotally connected at its mid-portion to the pivot shaft and having first and second mounting surfaces individually generally facing a respective one of the mounting surfaces of said arms defining two pairs of facing mounting surfaces; and

spring means positioned between each pair of facing mounting surfaces in load bearing and force transferring relation; and

wherein said mounting surfaces are arranged relative to the pivot shaft so that substantially only compressive forces are tranmitted to the spring means upon movement of the mounting surfaces of each pair of facing mounting surfaces toward one another.

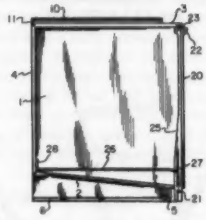
4,519,655

STORAGE CONTAINER

Charles F. Kamperman, 2596 Matterhorn Dr., Wexford, Pa. 15090

Filed Apr. 22, 1983, Ser. No. 487,746
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—12 **9 Claims**

1. A storage container having a shell with an open front forming a storage compartment and a closure member adapted to close the front of said shell, said shell having a pair of spaced substantially parallel sidewalls, a top wall, a rear wall and a bottom wall extending between said spaced sidewalls, an elongated rigid slide at the bottom of said shell located above said bottom wall for supporting at least one item within said shell, said closure member being pivotally connected to the lower forward corners of said spaced sidewalls, a pivotal connection between the forward end of said rigid slide and said closure member, said pivotal connection between said rigid slide and said closure member being located above the pivotal connection between said closure member and said sidewalls when said closure member is in the closed position, and a contact leg on the rear end of said rigid slide, whereby when said closure member is pivoted into the open position, said rigid slide is moved forwardly by means of the pivotal connection between



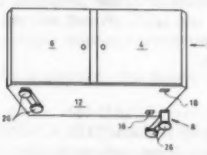
the forward end of said rigid slide and said closure member and said contact leg is adapted to contact an item resting on said rigid slide to move a portion of the item through the open front of said shell.

4,519,656

BATHROOM CABINET

Zeev Raz, 17 Keren Hayessod St., Beer-Sheva, Israel

Continuation-in-part of Ser. No. 44,096, May 31, 1979, Pat. No. 4,307,923. This application Sep. 21, 1981, Ser. No. 304,087
Claims priority, application Israel, Sep. 10, 1980, 61043; Spain, Feb. 17, 1981, 499.497; Israel, May 5, 1981, 62787
Int. Cl.³ A47B *91/16, 97/00*; E03D *1/00*
U.S. Cl. 312—256 **11 Claims**



1. A cabinet especially for storing and dispensing sanitary commodities, characterized in that said cabinet is provided with at least one compartment and at least one access door thereto and wherein said cabinet is further provided with attachment means depending from a bottom surface thereof for attachment of said cabinet atop a cover of a bathroom flush tank as an integral unit with said cover, whereby said cabinet and cover are readily removable as a unit to allow access to a flushing mechanism within the flush tank in case of malfunction, and wherein said attachment means has at least one bottom surface which is substantially planar and includes means for displacing said bottom surface so as to be non-parallel with respect to the bottom of said cabinet, thereby rendering said cabinet compatibly attachable to bathroom flush tank covers of various sizes, configurations and curvatures, wherein said attachment means comprise a first member detachably attachable to the bottom surface of said cabinet, said member being provided with at least one protruding element extending downwardly from said first member when attached to said bottom of said cabinet, said member and said element being provided with interconnecting means enabling the adjustment of the distance of protrusion of said element from said member.

4,519,657

MULTIPLE SERVICE UNIT

Henning Jensen, Surfers Paradise, Australia, assignor to Common Sense Products Pty. Ltd., Surfers Paradise, Australia

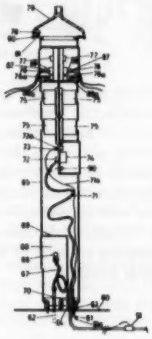
PCT No. PCT/AU81/00019, § 371 Date Oct. 6, 1981, § 102(e) Date Oct. 6, 1981, PCT Pub. No. WO81/02495, PCT Pub. Date Sep. 3, 1981

Continuation-in-part of Ser. No. 204,830, Nov. 7, 1980, abandoned. This PCT application Feb. 19, 1981, Ser. No. 309,886

Claims priority, application Australia, Feb. 19, 1980, PE 2443

Int. Cl.³ H01R *13/639*

U.S. Cl. 339—15 **15 Claims**



1. A service unit for controlled distribution through individually lockable doors, and for individual metering, of electrical services to a plurality of authorized users comprising:

a weatherproof hollow body,

transparent windows in the walls of said hollow body,

power distribution means for distributing electrical power from a power conduit connected thereto to a plurality of electric power receptacles,

a plurality of electrical meters for measuring the power consumed through the electrical power receptacles by each authorized user,

said meters being readable through said windows, said electric power receptacles, said power distribution means, and said electric meters being located entirely within said hollow body,

a plurality of openings in said hollow body, each opening being associated with at least one electrical power receptacle, each receptacle being accessible through an opening

lockable access door means for lockably securing each opening so that only authorized users have access through said door to at least one electrical power receptacle located therebehind.

4,519,658

ELECTRONIC PACKAGE ASSEMBLY AND ACCESSORY COMPONENT THEREFOR

Ranjit Biswas, Plainsboro, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Jan. 24, 1983, Ser. No. 460,434

Int. Cl.³ H01R *23/72*

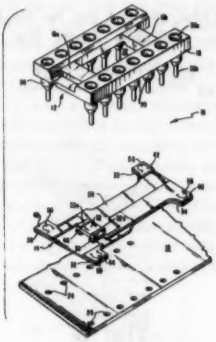
U.S. Cl. 339—17 CF **12 Claims**

1. An accessory circuit component for electrical connection to selected contacts of a plurality of contacts in an electrical package comprising:

a flexible sheet of dielectric material;

a plurality of spaced conductive traces secured to a surface of said flexible sheet; and

a plurality of deflectable tabs each being in registry with selected ones of said conductive traces and defined by at least one cut through both a portion of said flexible sheet and a portion of a conductive trace and a hinge including an uncut extent of said flexible sheet portion and a conductive trace portion adjacent said cut, there being provided upon deflection of each tab an opening for receipt of a selected contact of said electrical package for connection of such contact to said conductive trace portion,



said flexible sheet being elongate, ear portions extending laterally from a side margin at longitudinally spaced locations defining therebetween a cutout of said flexible sheet for residence therebetween of contacts of said package to which connection is not to be made, a conductive trace being disposed on each said ear portion and a deflectable tab being in registry with each such ear portion.

4,519,659

SOCKET-TYPE CONNECTOR FOR FLAT CABLES

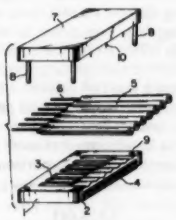
Mitsuo Shiino, and Akio Nakamura, both of Saitama, Japan, assignors to Shin-Etsu Polymer Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1983, Ser. No. 558,839

Claims priority, application Japan, Dec. 7, 1982, 57-185496[U]

Int. Cl.³ H01R *9/07, 11/11*

U.S. Cl. 339—59 M **4 Claims**



1. A socket-type connector for flat cables which comprises a base plate made of an electrically insulating material and provided with a plurality of slots running in parallel with each other, an anisotropically electroconductive sheet applied or bonded to one surface of the base plate to cover the slots therein, the direction of the anisotropic electric conduction of the said sheet being substantially perpendicular to the surface of the sheet, and a cover member to fit the other surface of the base plate made of an electrically insulating material.

4,519,660

ELECTRICAL CONNECTORS WITH QUASI-TERMINAL PINS

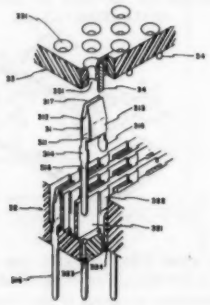
Yoshiaki Ichimura; Atsuhito Noda; Tetsuro Tokaichi, and Shoji Umesato, all of Tokyo, Japan, assignors to Japan Aviation Electronics Industry, Limited and NEC Corporation, both of Tokyo, Japan

Filed Mar. 15, 1984, Ser. No. 589,879

Claims priority, application Japan, Mar. 17, 1983, 58-37471[U]

Int. Cl.³ H01R *13/629*

U.S. Cl. 339—75 M **13 Claims**



1. In an electrical connector for electrically connecting a conductive terminal pin member to an electrical circuit, said electric connector including a contact element being made of a conductive and resilient material, said contact element having a mounting stem to be electrically connected to said electric circuit, at least one spring arm and a contact portion formed at a free end of said spring arm, said contact portion having a contact surface at one side thereof, said contact surface generally extending in lateral and longitudinal directions, a fixed insulator member being fixedly disposed in relation to said contact element, said fixed insulator member having a recess for embracing therein said contact portion, an insulator cover member overlying said fixed insulator member and having a penetrating hole for receiving therein said conductive terminal pin member and guiding said conductive terminal pin member to be positioned adjacent said contact portion, said insulator cover member permitting said conductive terminal pin member to laterally move towards said contact portion and in said lateral direction so as to effect frictional and electrical engagement of said conductive terminal pin member with said contact surface, the improvement which comprises said insulator cover member being slidable on said fixed insulator member so that said penetrating hole can move in said lateral direction from a first position offset from said contact portion to a second position right above said contact portion, and quasi-terminal pin means having a top end connected with a bottom surface of said cover member adjacent said penetrating hole, said quasi-terminal pin means being in press-contact with said contact surface in a condition that said penetrating hole is positioned offset from said contact portion.

4,519,661

CONNECTOR ASSEMBLY HAVING AN ANTI-DECOUPLING MECHANISM

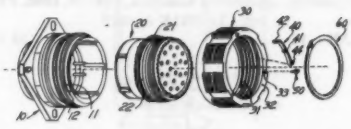
Robert W. Brush, Sr., Unadilla, and Eric F. Shepler, Bainbridge, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Dec. 9, 1983, Ser. No. 560,036

Int. Cl.³ H01R *13/623*

U.S. Cl. 339—89 M **4 Claims**

1. In combination with a connector assembly of the type having: a first tubular housing having around an outside portion thereof at least one thread, each thread having at its starting end an axially extending shoulder; a second tubular housing; a coupling ring having around the inside portion thereof at least one thread mated with a respective thread on said first housing; means for rotatably mounting said coupling ring to said second housing; and means for retarding rotation of said coupling ring including: a plurality of teeth annularly arranged on said second housing; at least one elongated spring having a projection thereon; and means for mounting each of said springs at one end to an inside portion of said coupling ring so



that the projection on each of said springs engages said teeth on said second housing, the improvement wherein the means for retarding rotation of said coupling ring further includes:

an axially extending portion at the free end of each of said springs adapted to engage a respective axially extending shoulder at the start of a thread on said first tubular housing and move said projection inwardly to increase the pressure between said projection and teeth during the final portion of coupling rotation of the coupling ring around said first tubular housing.

4,519,662

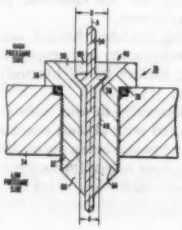
HIGH PRESSURE ELECTRICAL PENETRATOR

Robert F. Riley, Ellicott City; Thomas I. Meyer, Severna Park, and Wesley N. Jordan, Annapolis, all of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 8, 1982, Ser. No. 366,456

Int. Cl.³ H01R *4/00*

U.S. Cl. 339—94 R **8 Claims**



1. An electrical penetrator comprising:

(a) a metallic penetrator body;

(b) said penetrator body including an interior aperture extending therethrough and having a central longitudinal axis;

(c) said interior aperture including a cylindrical portion symmetrical about said axis and which flares out to define an enlarged aperture portion;

(d) an electrically conducting pin member lying substantially along said axis and having a bulbous portion positioned within said enlarged aperture portion;

(e) said bulbous portion being of such dimension so as to be unable to fit through said cylindrical portion;

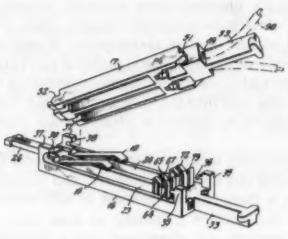
(f) an encapsulating compound within said interior aperture to maintain said pin member in position displaced from the wall surface of said interior aperture, said compound comprising an epoxy having an inorganic filler of silica.

4,519,663

WIRE PLUG ASSEMBLY

Paul V. De Luca, Plandome Manor, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Jun. 14, 1982, Ser. No. 387,935
Int. Cl.[3] H01R 9/07
U.S. Cl. 339—99 R 3 Claims



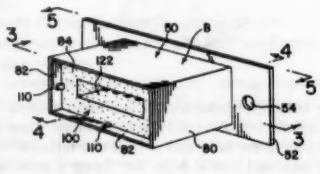
1. An improved wire plug assembly for use in interconnecting a telephone subscriber pair between corresponding connecter blocks comprising: first and second elongate interconnectable housing members, means at first and second ends of said housing members for the interconnection of said housing members to define plural communicating recesses therein; a pair of resilient contact members disposed in two parallel recesses of said plural recesses, said housing member defining end openings for the insertion of electrically conductive pins therethrough to engage said resilient contact members substantially at one end thereof; said contact members having wire insulation displacement means substantially at a second end thereof, at least one of said housing members defining end openings therein for the insertion of an insulated conductor to be positioned opposite the insulation displacement means of one of said contact members, said insulation displacement means engaging an end of said conductor upon the closing of said pair of housing members to assemble said plug assembly; said housing element having a resilient detent projection on an end thereof adjacent said openings for said conductive pins for the engagement of a corresponding opening in a jack board, and a handle member on an opposite end of said housing element to permit disengagement of said plug assembly from said jack board.

4,519,664

MULTIPIN CONNECTOR AND METHOD OF REDUCING EMI BY USE THEREOF

John D. Tillotson, Southfield, Mich., assignor to Elco Corporation, El Segundo, Calif.

Filed Feb. 16, 1983, Ser. No. 466,977
Int. Cl.[3] H01R 13/658
U.S. Cl. 339—143 R 43 Claims



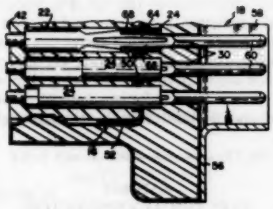
1. In a multipin connector to be fixedly mounted over a conductor access opening in a supporting wall of a digital device of the type operated by signals having frequency components capable of radiating electromagnetic waves above about 5–30 Megahertz, said connector comprising a header having a header wall with means for securing said header wall over said opening and on said supporting wall, means for fixedly supporting a plurality of conductor interconnecting pins on parallel axes passing through said access opening in a preselected pin layout pattern with said pins having first ends pointing away from said wall and second ends pointing in the direction opposite to said first ends, and means on said header for electrically isolating said pins one from the other, the improvement comprising: a pin encircling member formed of a blend of finely divided particles surrounded by an electrical non-conductive material, said blend of particles including at least a first material having a high magnetic permeability, low magnetic retentivity and a second, electrically conductive material, said encircling member having a central bore with an inwardly facing profile generally matching said pin pattern, a first end portion, and a second end portion surrounding said pins a selected distance therefrom; and means for fixedly mounting said pin encircling member of said header with said inwardly facing profile of said bore surrounding said pins and said first end portion spaced away from said header wall a distance greater than said first ends of said pins.

4,519,665

SOLDERLESS MOUNTED FILTERED CONNECTOR

Rickie M. Althouse, Harrisburg; Robert E. Beamenderfer, Palmyra; Roger Durbin, Lancaster; Robert D. Hollyday, Elizabethtown, and John P. Kling, Mt. Joy, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 19, 1983, Ser. No. 562,638
Int. Cl.[3] H01R 13/648, 13/66
U.S. Cl. 339—147 R 4 Claims



1. A solderless, filtered electrical connector comprising:

a first elongated housing of insulative material defining a forwardly directed mating face, a rearwardly directed cavity, a plurality of passages extending between said cavity and said mating face, and at least one lateral latching opening, said housing being plated with a conductive material except in and immediately adjacent said passages;

a second housing of insulative material dimensioned to be received in said cavity of said first housing and having a like plurality of passages extending between forward and rearwardly directed faces, at least one laterally directed latching lug positioned to engage a respective latching opening in said first housing;

a grounding member of conductive material interposed between said first and second housing members and having a plurality of apertures aligned with the respective passageways, each aperture being profiled by a plurality of inwardly directed tines; and

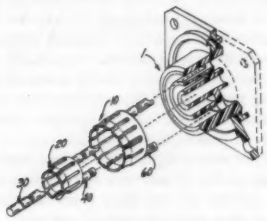
a plurality of filtered terminals each formed by a filter sleeve mounted on a compliant portion of a pin terminal.

4,519,666

TRIAXIAL ELECTRICAL CONNECTOR

Robert L. Williams, Bainbridge, and Christopher Marks, Guilford, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Filed Aug. 15, 1983, Ser. No. 523,481
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. In combination with a triaxial electrical connector of the type having an electrical nonconducting housing having a plurality of axially extending passages therein; a first tubular electrical conductor having a plurality of spring fingers at one end and a radially extending lip at the other end thereof, said lip having at least one notch; a second tubular electrical conductor located coaxially within and spaced from the first tubular electrical conductor; a center electrical conductor mounted coaxially of and spaced from said first and said second tubular electrical conductors; and a means for mounting said conductors within said housing, the improvement wherein said means for mounting said conductors within said housing comprises:

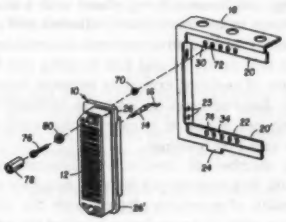
a plurality of electrically conductive terminals each having a forward end portion that includes an annular groove, a portion of each annular groove being located in a respective notch in one of said first and second tubular electrical conductors, each said terminal being plastically deformed locally of its groove and about its notch so as to be mechanically connected to the lip of a respective tubular electrical conductor, a rearward end portion of each said terminal extending through a respective axial passage in said housing; and a potting material comprised of an electrically non-conductive material being disposed in a rear portion of said housing for mechanically connecting the rearward end portion of each said terminal within the housing.

4,519,667

ELECTRICAL CONNECTOR

Terry D. Canning, Marion, and Francis E. Hovan, Cedar Rapids, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 6, 1982, Ser. No. 375,787
Int. Cl.³ H01R *13/645*
U.S. Cl. 339—186 M **1 Claim**



1. In a system of electrically interconnected electronic and electrical equipment including a first structural element comprising a rack assembly and a second structural element comprising a modular electronic unit supported by said rack assembly and removable therefrom, an electrical connector comprising:

a first electrical-connector element attachable to one of said structural elements;

a second electrical-connector element attachable to the other one of said structural elements, said second electrical-connector element being mutually engageable with said first electrical-connector element, each of said first and said second electrical-connector elements being a unitary body of molded plastic material carrying a plurality of electrical contacts electrically connecting the modular electronic unit into the system when said first and said second electrical connector elements are mutually engaged;

means for attaching said first electrical-connector element to its associated said structural element, said attaching means including a threaded nut pressed in said one structural element, and further including at least two double-D shaped apertures for alignment, and a threaded screw carried in said one electrical-connector element; and

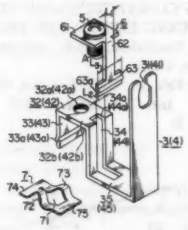
means for keying said first and said second electrical-connector elements whereby electrically compatible pairs of said first and said second electrical-connector elements are made mutually engageable and electrically non-compatible pairs of said first and said second electrical-connector elements are prevented by said keying means from being mutually engaged, said keying means including a keyway coaxial with said attaching means, the keyway being retained in said one electrical-connector element by the screw, said keying means including a key insertable in the keyway when said first and said second electrical-connector elements are mutually engaged, said key being attached to the other one of said first and said second electrical-connector elements.

4,519,668

WIRE TERMINAL CONNECTOR

Teizo Fujita, Ibaraki, and Yoshitaka Tsuji, Toyonaka, both of Japan, assignors to Idec Izumi Corporation, Osaka, Japan

Filed Nov. 28, 1983, Ser. No. 555,728
Claims priority, application Japan, Nov. 29, 1982, 57-210447; Nov. 29, 1982, 57-210448
Int. Cl.³ H01R *13/11*
U.S. Cl. 339—241 **13 Claims**



1. A wire terminal connector for use in an electric device, comprising an electrically conductive terminal plate formed with at least one screw hole, and at least one terminal screw to be screwed into said screw hole, for fixing a wire terminal between said terminal plate and said terminal screw, in which said terminal connector further comprises:

a movable member slidably supported for movement perpendicularly to said terminal plate, said movable member including a first portion extending parallell with said terminal plate and having means for supporting said terminal screw, and a second portion integrally formed with

said first portion and extending perpendicularly to said first portion from one end of said first portion, said second portion having a stopper portion for limiting said first portion to a range of movement relative to said terminal plate, said first portion being movable between a first position in which a threaded end of said terminal screw is spaced a predetermined distance away from said terminal plate and opposed to said screw hole and a second position in which said threaded screw end is adjacent said terminal plate and opposed to said screw hole;

a compression spring with one end supported by said second portion of said movable member; and

a fixed spring-support means for supporting said compression spring at the other end thereof so that said first portion is stably held in at least said first position with said threaded screw end spaced said predetermined distance away from said terminal plate by a restoration force of said compression spring.

4,519,669

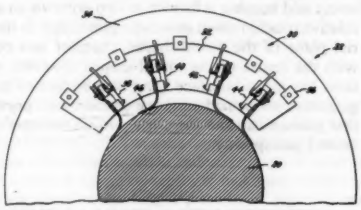
BRAID CLAMP FOR GENERATOR SHAFT VOLTAGE AND CURRENT PICKUP

James B. Archibald, Schenectady, and James V. Eats, Albany, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,064

Int. Cl.³ H01R *4/50*

U.S. Cl. 339—274 **9 Claims**



1. Apparatus for clamping a strip of conductive material in trailing contact with a surface of a shaft, comprising:

a stationary member;

insulated means for affixing said stationary member a predetermined distance from said surface;

a first clamp portion on said stationary member;

said first clamp portion having a first clamping face;

a second clamp portion having a second clamping face;

a clamp base on said stationary member;

means for hinging said second clamp portion to said clamp base;

a handle having first and second positions;

a compound lever connected to said handle and said second clamp portion;

said compound lever including means responsive to said lever being placed in said first position for forcibly urging said second clamping face into locking contact with a portion of said strip of conductive material on said first clamping face whereby said strip of conductive material is firmly clamped between said first and second clamping faces; and

said compound lever further including means responsive to said lever being placed in said second position for hinging said second clamping face away from said strip of conductive material on said first clamping face whereby said strip of conductive material is released.

4,519,670

LIGHT-ROTATION COUPLING FOR A PLURALITY OF CHANNELS

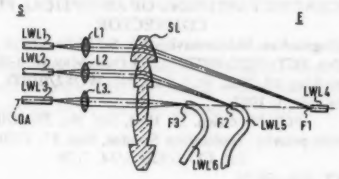
Georg Spinner, Westerham; Manfred Lang, Taufkirchen, and Anton Pautz, Munich, all of Fed. Rep. of Germany, assignors to Spinner GmbH, Elektrotechnische Fabrik, Fed. Rep. of Germany

Filed Sep. 14, 1982, Ser. No. 417,913

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1982, 3207469

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.15 **6 Claims**



1. Apparatus for transmitting a plurality of channels of light between two members where the members have rotational movement with respect to each other;

said plurality of channels of light having light receiving means individual to each channel on one of said members;

said light receiving means for each channel being spaced successively at different radial distances from the axis of said rotational movement;

the other of said members having light output means individual to each channel, the said light output means being spaced successively at different distances along the axis of relative rotation;

each light receiving means corresponding to a light output means; and

means for directing the light from each light output means to the light receiving means corresponding thereto.

4,519,671

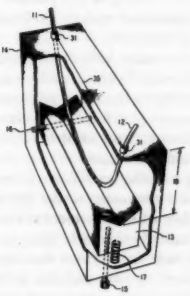
OPTICAL ATTENUATOR

Lyn Curtis, Fair Haven, and William C. Young, Middletown, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 1, 1983, Ser. No. 481,483

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.15 **7 Claims**



1. Apparatus for providing variable attenuation of an optical signal, said apparatus comprising

means adapted to receive at least one pair of signal conducting optical fibers each having a longitudinal axis wherein

the fibers in each pair are in series with one another and the fiber ends in each pair abut one another,

means for biasing the ends of any received pair of optical fibers against said receiving means, and

means for forming a variable angle between the the longitudinal axes of any received pair of optical fibers while maintaining contact between the ends of said pair of fibers, said optical signal attenuation being a function of said formed angle.

4,519,672

METHOD FOR OBTAINING AN ACCURATE CONCENTRIC FASTENING OF AN OPTICAL FIBRE IN A CONNECTOR

Ivan Rogstadius, Sidensvasvägen 6, S-125 31 Älvsjö , Sweden

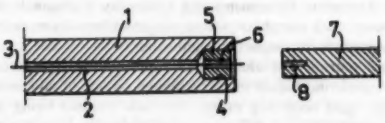
PCT No. PCT/SE81/00270, § 371 Date May 10, 1982, § 102(e) Date May 10, 1982, PCT Pub. No. WO82/01077, PCT Pub. Date Apr. 1, 1982

PCT Filed Sep. 17, 1981, Ser. No. 380,870

Claims priority, application Sweden, Sep. 17, 1980, 8006532

Int. Cl.³ G02B *5/14, 7/26*

U.S. Cl. 350—96.20 **3 Claims**



1. The method of fastening an optical fiber to an end face of a connector so that said fiber, so fastened, passes from said end face axially through said connector, comprising the following steps performed in the order stated:

(a) providing an elongated connector which has an axial bore extending therethrough, said bore having a radially enlarged end portion at one end thereof which opens into an end face of said connector, the axial length of said radially enlarged end portion being substantially smaller than the length of said axial bore;

(b) inserting a solid rod of nonelastic ductile material into said radially enlarged end portion of said bore from said end face of said connector, said rod having an outer diameter that is slightly smaller than the inner diameter of said enlarged end portion of said bore;

(c) applying an axial force from the exterior of said end face of said connector to the end of said rod which faces said end face of said connector to deform said inserted rod radially outwardly into firm engagement with the inner walls of said enlarged end portion of said bore thereby to fix said deformed rod in position in said enlarged end portion of said bore;

(d) forming an axial hole in said rod which is in alignment with said axial bore in said connector and in accurate concentricity to the outer surface of said connector,

(e) inserting an optical fiber into the axial hole in said rod to extend through said axial hole into and along said axial bore in said connector,

(f) applying a further axial force from the exterior of said end face of said connector to the end of said rod which faces the end face of said connector thereby to further deform said rod radially inwardly so as to reduce the diameter of the axial hole in said rod thereby to fixedly attach said optical fiber to said radially deformed rod in accurate concentricity to the outer surface of said connector, and

(g) machining said end face of said connector so that said end face of said connector, the end of said deformed rod which faces said end face, and the end of said optical fiber adjacent said end face of said connector all lie in the same plane.

4,519,673

OPTICAL WAVEGUIDE SLIP RING ASSEMBLY

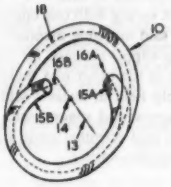
James G. Hamilton, Glasgow, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

Filed Apr. 5, 1983, Ser. No. 482,971

Claims priority, application United Kingdom, Apr. 28, 1982, 8212254

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.32 **9 Claims**



1. An assembly for maintaining optical communication between relatively movable members, comprising a housing made of a low refractive index material and defining a chamber in the form of a hollow toroid, and first and second passageways leading from said toroid-shaped chamber such that there is substantially stepless transition from said toroid-shaped chamber in a clockwise direction into the first passageway and from the toroid-shaped chamber in a counter-clockwise direction into the second passageway, said passageways and toroid-shaped chamber being filled with a fluid of high refractive index whereby said assembly forms a light guide,

wherein said housing is formed in two portions mounted for relative rotation about an axis perpendicular to the equatorial plane of the toroid-shaped chamber and coincident with the centre of the toroid-shaped chamber, said portions having an interface lying on a surface of revolution generated about said axis, one portion incorporating said first passageway and the other portion incorporating said second passageway.

4,519,674

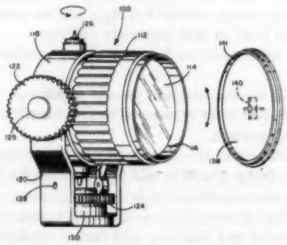
RETRO-REFLECTIVE PRISM ASSEMBLY

Galen L. Buckley, 40 Ashwood, Irvine, Calif. 92715, and Kenneth Panique, 19371 Lemon Hill Dr., Santa Ana, Calif. 92705

Continuation-in-part of Ser. No. 473,782, Mar. 10, 1983, abandoned. This application Apr. 4, 1983, Ser. No. 481,920

Int. Cl.³ G01C *15/06*; G02B *7/18*

U.S. Cl. 350—102 **9 Claims**



1. An improved retro-reflective prism assembly comprising:

a retro-reflective prism,

a substantially cylindrical prism housing having an open end for receiving said prism and having a closed end of substantially conical shape,

a retaining ring threadably engaging said open end of said prism housing for securing said prism within said prism housing,

a pivoting housing of substantially cylindrical configuration and having an open end for receiving said closed end of said prism housing, and

a U-shaped yoke member, the opposing sides of said yoke member being rotatably attached to said pivoting housing at opposed locations thereon, and the bottom of said yoke member being configured for rotatable connection to a tripod,

said prism housing and said retaining ring each comprising a portion of an annular groove, said groove being completed upon threaded engagement of said retaining ring and said prism housing, and said assembly further comprising an O-ring contained within said completed groove in compressive engagement with said prism and in sealing engagement with the engaging surfaces of said prism housing and said retaining ring, whereby to provide a watertight seal of said prism housing without gluing said retaining ring to said prism housing.

4,519,675

SELECTIVELY LIGHT TRANSMITTING PANEL

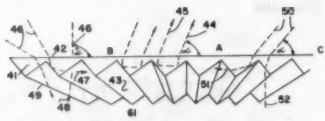
Yitzchak Bar-Yonah, 22 Rehov Tamar, Neve Monoson, Israel

Filed Mar. 29, 1983, Ser. No. 480,240

Claims priority, application Israel, Apr. 18, 1982, 65514

Int. Cl.³ G02B *17/00, 27/00*

U.S. Cl. 350—259 **16 Claims**



1. A generally vertically disposed window panel providing light transmissivity modulation as a function of the time of day and which selectively transmits rays of light incident at a range of angles of incidence while reflecting rays of light incident within a narrow range of angles of incidence comprising:

a prism array comprising a pluraity of adjacent triangular prisms;

said prisms having one right angle, the other two angles being such as to result in the double total internal reflection of rays incident within said narrow range of angles of incidence;

said narrow range of angles of incidence being selected from angles greater or less than 90.

4,519,676

PASSIVE DISPLAY DEVICE

Ties S. te Velde, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,420

Claims priority, application Netherlands, Feb. 1, 1982, 8200354

Int. Cl.³ G02D *25/00*

U.S. Cl. 350—269 **18 Claims**

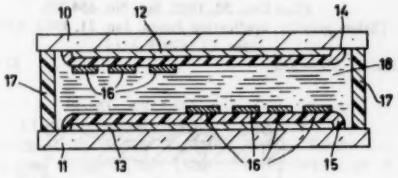
1. A passive display device comprising

first and second supporting plates with at least one of said supporting plates being transparent,

first and second electrodes on facing surfaces of said first and second supporting plates respectively, at least said first electrodes being transparent,

third electrodes movable between said first and second electrodes by electrostatic forces, said third electrodes including apertured display parts secured to one of said first and second supporting plates by a plurality of resilient elements,

wherein said resilient elements are located between said display parts of said third electrodes and said second of said supporting plates at a side remote from said first of said supporting plates, and



an opaque liquid between said supporting plates, said opaque liquid having a color contrasting with a color of said third electrodes facing said first supporting plate.

4,519,677

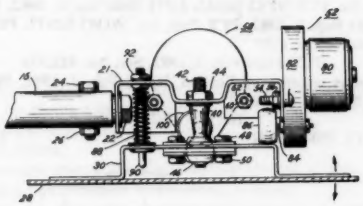
POWER-OPERATED VEHICLE MIRROR

Randall W. Weber, and Charles A. Weber, both of Elkhart, Ind., assignors to Bock Products, Inc., Elkhart, Ind.

Filed May 6, 1983, Ser. No. 492,055

Int. Cl.³ G02B *7/18*

U.S. Cl. 350—637 **5 Claims**



1. A power-operated mirror for mounting on a vehicle, comprising a housing, a bracket in said housing, a cam follower means having an outwardly facing mirror plate forming one side of said housing, a post secured to said bracket and extending outwardly substantially perpendicular to said bracket, a ball joint disposed on the end of said post opposite said bracket pivotally connecting said cam follower to said post, said cam follower means including a backing plate pivotally mounted on said ball joint and having said mirror plate secured to the outer surface thereof, a pair of cam means disposed at substantially right angles to one another around said post and abutting said cam follower means, a motor means for each of said cam means for changing the position of said mirror plate relative to said vehicle on at least two axes, and a resilient means disposed from both of said cam means at an angle greater than 90 degrees around said ball joint yieldably urging said cam follower means against said cam means, and including a pin secured to said bracket and extending toward said backing plate and a spring disposed around said pin between said bracket and said backing plate.

4,519,678

LIQUID CRYSTAL DISPLAY DEVICE

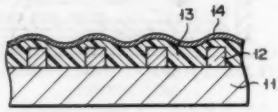
Yoshiaki Komatsubara, Yokohama; Kyozoh Ide, Fujisawa, and Eiko Munakata, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 30, 1982, Ser. No. 454,708

Claims priority, application Japan, Jan. 21, 1982, 57-7923

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—338 **11 Claims**



1. A method for manufacturing a reflective type liquid crystal display device, comprising the steps of:

forming a projection pattern on a substrate by selective etching using a mask pattern;

forming a polymer resin layer on the projection pattern, said polymer resin layer having small protrusions and depressions in one surface, said protrusions and depressions having a gently curved profile and conforming with the projection pattern; and

forming a reflective metal film on the polymer resin layer, said reflective metal film having small protrusions and depressions in one surface, said protrusions and depressions having a gently curved profile conforming with the surface profile of the polymer resin layer to produce a reflective part of the reflective type liquid crystal display device.

4,519,679

LIQUID CRYSTAL DISPLAY DEVICE

Kenji Horikiri; Fumio Ueda, and Hiroaki Ideno, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

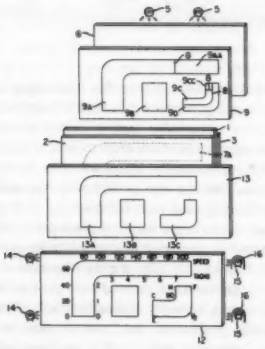
PCT No. PCT/JP82/00032, § 371 Date Sep. 8, 1982, § 102(e) Date Sep. 8, 1982, PCT Pub. No. WO82/02973, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 3, 1982, Ser. No. 422,978

Claims priority, application Japan, Feb. 3, 1981, 56-15408; Feb. 27, 1981, 56-28892

Int. Cl.³ G02F *1/13*

U.S. Cl. 350—339 R **5 Claims**



1. A liquid crystal display device comprising: a TN type liquid crystal display element having a plurality of liquid crystal display patterns formed thereon; a front panel having semi-transparent ink portions aiding the recognition of display contents and a plurality of transparent portions identical in shape to said liquid crystal display patterns on a surface of a transparent substrate respectively, said front panel being provided on the remaining portions with a light shielding print; a first polarizer and a second polarizer which are arranged such that said display element is between and in contact with said polarizers and which have their optical axes parallel to each other, said first polarizer being formed of a plurality of polarizing plates identical in shape to and somewhat larger in size than said liquid crystal display patterns respectively and disposed on one side of said display elements, said polarizing plates being identical to or somewhat larger in size than said transparent portions on said front panel, said second polarizer being disposed on the entire area of another side of said display element; a color filter disposed in contact with said second polarizer, said color filter including a plurality of color filter portions identical in shape to said liquid crystal display patterns respectively; a transflector disposed in contact with said color filter; and a light source disposed to effect the illumination through said transflector.

4,519,680

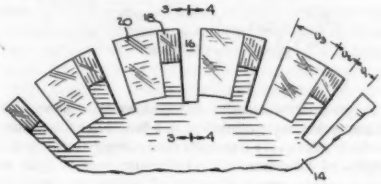
BEAM CHOPPER FOR PRODUCING MULTIPLE BEAMS

Everett C. Grollimund, Midlothian, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,587

Int. Cl.³ B23K *27/00*; G02B *27/40*

U.S. Cl. 350—486 **6 Claims**



1. A beam chopper system comprising: a disc having an axis parallel to the path of an incident beam of radiation, said disc being rotatable about said axis; a circular locus on said disc for intercepting an incident beam of radiation and including a plurality of segments, each said segment comprising, in a predetermined order, a transmissive portion, a first reflective portion inclined at a first oblique angle to said axis for directing an incident beam in a first direction, and a second reflective portion inclined at a second oblique angle to said axis for directing an incident beam in a second direction distinct from said first direction.

4,519,681

SOFT LENTICULAR CONTACT LENS WITH NEGATIVE REFRACTION

Otto Wichterle, Prague, Czechoslovakia, assignor to Ceskoslovenska Adademie Ved, Prague, Czechoslovakia

Filed Jan. 28, 1982, Ser. No. 343,510

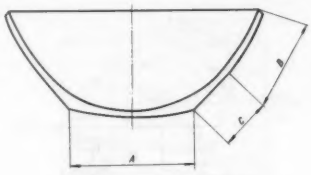
Claims priority, application Czechoslovakia, Feb. 2, 1981, 764-81

Int. Cl.³ G02C *7/04*

U.S. Cl. 351—160 H **7 Claims**

1. A soft lenticular contact lens with negative refraction, wherein the outer convex surface comprises a central curved

surface (A) and a circumferential curved ring (B), said central surface and said curved ring being linked together by a conic



surface (C), tangentially passing into the circumferential curved ring (B).

4,519,682

OPTICAL IMAGE AMPLIFIER

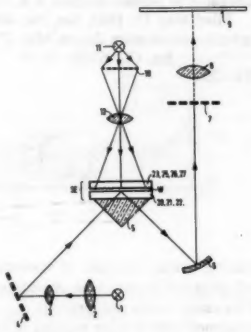
Fred Mast, Wil, and Rudolf Waser, Regensdorf, both of Switzerland, assignors to GRETAG Aktiengesellschaft, Regensdorf, Switzerland

Filed Nov. 5, 1980, Ser. No. 204,174

Claims priority, application Switzerland, Nov. 8, 1979, 10003/79

Int. Cl.³ G03B *21/00*

U.S. Cl. 353—122 **18 Claims**



1. A device for amplifying the intensity of an optically created image, comprising:

a light source;

a first bar system for modulating light rays from said source;

a control element for reflecting modulated rays from said first bar system, including:

a control layer deformable by electrical field forces and having a reflecting surface thereon,

an electrode grid comprising a group of electrically conductive strips having regular spacing between them,

a photoelectric conducting layer on which an image to be amplified is imaged to modulate an electric field produced by said electrode grid, said photoelectric conducting layer being disposed between said electrode grid and said control layer,

a counterelectrode disposed on the side of said control layer opposite said photoelectric, conducting layer,

an alternating current power source connected between said electrode grid and said counterelectrode, and

means for applying the same electrical potential to each of the conductive strips of said electrode grid relative to said counter-electrode;

a projection surface;

means for imaging light reflected by said control element on said projection surface; and

a second bar system disposed between said imaging means and said projection surface.

4,519,683

ELECTRONIC FLASH APPARATUS

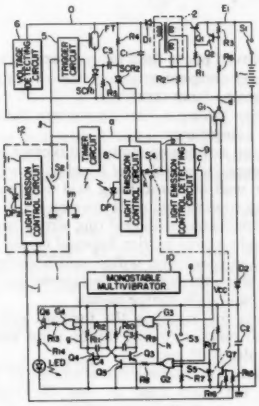
Nobuyoshi Hagyuda; Hiroshi Hasegawa, both of Tokyo; Yoshikazu Iida, Chigasaki, and Osamu Maida, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Continuation of Ser. No. 417,202, Sep. 13, 1982, abandoned. This application Aug. 24, 1984, Ser. No. 643,695

Claims priority, application Japan, Sep. 16, 1981, 56-144749

Int. Cl.³ G03B *15/02, 7/16*

U.S. Cl. 354—127.11 **4 Claims**



1. An electronic flash apparatus for use in combination with a camera for giving a light emission to an object for obtaining an appropriate exposure, comprising:

(a) flash means;

(b) capacitor means for accumulating electric charge for causing light emission from said flash means;

(c) charging means for charging said capacitor means to bring the voltage thereof to a level required for causing light emission from said flash means;

(d) light emission control means for controlling the quantity of light from said flash means;

(e) a light emission control detecting circuit for detecting that said control by said light emission control means is not effected within a determined period and releasing a detection signal;

(f) means for indicating, in response to said detection signal, that said control by said light emission control means has not been effected, said indicating means including means for generating an oscillation signal in response to said detection signal and means for emitting light in synchronization with said oscillation signal;

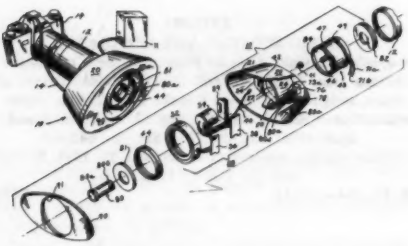
(g) power supply means for supplying power to said charging means, said light emission control means and said detecting means; and

(h) means for controlling said power supply means so that said power supply means may repeatedly stop power supply to said charging means in synchronization with oscillation of said oscillation signal.

4,519,684
PHOTO FLASH LAMP

Ralph M. Francis, Jr., 2937 Washington Ave., Racine, Wis. 53405, and Jerome C. Isaacson, 9033 Hulda Dr., Sturtevant, Wis. 53177

Filed Sep. 13, 1983, Ser. No. 531,935
Int. Cl.³ G03B *15/03*
U.S. Cl. 354—145.1 6 Claims



1. An improved photo flash lamp especially suited for macro-photography comprising:

(a) a ring strobe lamp assembly;

(b) a housing having a viewing passage therethrough, said housing comprising:

a shell having an opening at one end thereof opposite to, but in communication with said housing viewing passage;

an annular wall circumscribing said viewing opening and extending toward said shell opening so as to be adjacent to, and concentric with said ring strobe lamp assembly;

a tubular light source carrier disposed in said housing viewing passage concentric within said housing annular wall and extending through said ring strobe lamp assembly for carrying said light source means;

collar means for engaging the forward end of said lamp carrier to retain said ring strobe lamp assembly against said annular wall; and

a cover having an opening therethrough for overlying the opening into said shell so that the viewing passage through said shell communicates with the opening through said cover;

(c) means for attaching said housing to the lens of a camera so that said housing viewing passage communicates with the camera lens;

(d) high intensity examination light source means held in said housing about said viewing passage for providing a source of constant illumination to enable the subject matter to be photographed to be brought into sharp focus by the lens prior to subject matter illumination by said ring strobe lamp assembly; and

power means for energizing both said ring strobe lamp assembly and said examination light source means.

4,519,685
FINDER FOR SINGLE LENS REFLEX CAMERA

Kikuo Momiyama; Takashi Uchiyama; Ryoichi Suzuki, all of Kanagawa; Hiroyasu Murakami, Tokyo; Masaharu Kawamura, Kawasaki, and Shinji Sakai, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 105,986, Dec. 21, 1979, abandoned.
This application Nov. 13, 1981, Ser. No. 321,098
Claims priority, application Japan, Dec. 26, 1978, 53-164149
Int. Cl.³ G03B *17/20, 19/12*
U.S. Cl. 354—154 19 Claims

16. A single lens reflex camera comprising:

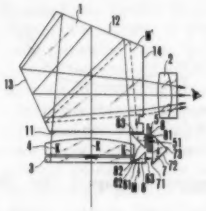
an objective;

a finder optical system;

a mirror for reflecting the light passing through said objective in the direction of said finder optical system;

first optical means for directing a portion of light reflected at said mirror out of the optical path between said mirror and said finder optical system;

second optical means for returning the light directed out of



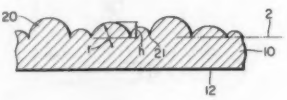
the optical path by said first optical means into said optical path; and

display means positioned in the optical path between said first optical means and said second optical means.

4,519,686
FOCUSING SCREEN OF A CAMERA

Yasutomo Seki, Kamakura; Toshio Akiyama, Fujisawa; Norio Nakabayashi, Yokohama, and Yutaka Iizuka, Fujisawa, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,201
Claims priority, application Japan, May 27, 1982, 57-90429
Int. Cl.³ G03B *13/24*
U.S. Cl. 354—200 8 Claims



1. A focusing screen capable of transmitting light therethrough and disposed between an objective lens and an eyepiece, said focusing screen comprising:

a surface formed with a large number of substantially hemispherical faces of irregular sizes disposed irregularly, the radius of curvature of said hemispherical faces being within the range of 8.5 to 52.8 μm and the height thereof along the screen thickness being within the range of 1.5 to 3.6 μm.

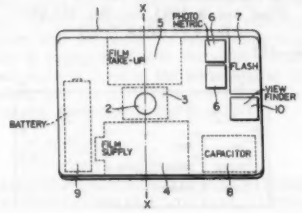
4,519,687
CAMERA WITH VERTICALLY ORIENTED FILM ADVANCE

Takao Kuge, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 532,180
Claims priority, application Japan, Sep. 21, 1982, 57-143658
Int. Cl.³ G03B *17/02*
U.S. Cl. 354—202 7 Claims

1. A camera comprising a camera body having a width that is longer than the height thereof; a photographing lens located at about the middle of the camera body both widthwise and heightwise; a film supply chamber and a film-take-up chamber arranged along a vertical axis in the direction of the height of the camera with one of said chambers positioned to one side of said photographing lens and the other of said chambers positioned to the other side thereof, said chambers being adapted to supply and take-up a roll of film having exposure frames thereon in the shape of a rectangle, such that the longer side of

the rectangle is parallel to the width of the camera; and a plurality of functional elements within said camera body ar-



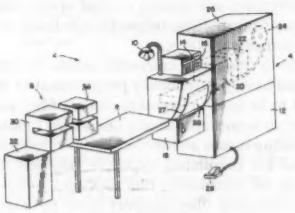
ranged for balance on both sides of said photographing lens in the widthwise direction of the camera body.

4,519,688

FILM SPLICING AND IDENTIFICATION SYSTEM

Paul E. Kitch, West Springfield; Raymond H. Crochetiere, Southampton; Gunnar G. Gudmundson, Longmeadow, and Walter R. Hadank, Springfield, all of Mass., assignors to Algorex, Inc., Chicopee, Mass.

Filed Sep. 1, 1982, Ser. No. 413,834
Int. Cl.³ G03D *13/01*
U.S. Cl. 354—297 **18 Claims**



1. Apparatus for processing a cassette containing photosensitive film, said apparatus comprising:

a source of illumination;

switch means connected to said source of illumination for turning said source of illumination on to provide light suitable for visual inspection of the cassette and for turning said source of illumination off to prevent light from reaching the photosensitive film;

opening means for opening the cassette to permit extraction of the photosensitive film contained therein, said opening means including an actuation means for actuating said opening means to perform the cassette opening operation;

a light-tight enclosure surrounding a film preparation means for receiving photosensitive film extracted from the cassette after said opening means has opened the cassette, said light-tight enclosure including a shutter means movable between an open position in which access is provided to said film preparation means from outside said enclosure and a closed position in which no light can reach said film preparation means, said shutter means having a shutter actuating mechanism which actuates said shutter means and;

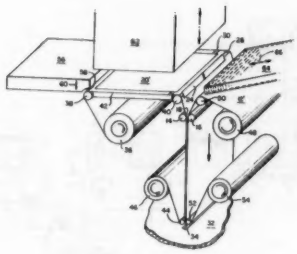
control means connected to said opening means, said switch means and said shutter actuating mechanism for extinguishing said source of illumination prior to the completion of said cassette opening operation and for moving said shutter means to said open position when said opening means is actuated but only after said source of illumination is extinguished.

4,519,689

METHOD AND APPARATUS FOR PROCESSING DISCRETE SHEETS OF FILM

Gordon F. Kinsman, Billerica; Ronald F. Lamberf, Wayland, and David A. Morrison, Framingham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 30, 1984, Ser. No. 595,471
Int. Cl.³ G03D *9/02*
U.S. Cl. 354—304 **31 Claims**



1. The method for processing discrete sheets of rapid access type photographic films, said method comprising the steps of:

providing means to establish a processing gap;

feeding first and second webs through said gap so that a working surface on one of said webs is presented in mutually facing relationship to a working surface on the other of said webs;

releasably securing a rapid access film sheet to the working surface of at least one of said webs;

supplying a quantity of processing fluid to the working surfaces of said webs in advance of web passage through said gap and forwardly of the rapid access film sheet so that the processing fluid is spread uniformly over the area of said sheet as it passes with said webs through said gap; and

removing said sheet from said one web after passage thereof through said gap.

4,519,690

PROCESS FOR DEVELOPING OR PEELING ALKALI-TYPE PHOTOSENSITIVE FILM AND APPARATUS USED THEREIN

Yoshiaki Tomisawa; Toshio Takeuchi; Keijiro Honda, all of Hitachi; Susumu Takahashi, Ibaraki, and Seiji Kinoda, Fujisawa, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,911
Claims priority, application Japan, Aug. 6, 1982, 57-137822
Int. Cl.³ G03D *5/04*
U.S. Cl. 354—324 **6 Claims**

1. An apparatus for developing or imagewisely peeling an alkali-type photosensitive film comprising

a developing or peeling device for developing or imagewisely peeling an alkali-type photosensitive film with a developing or peeling solution,

a solution tank for receiving the developing or peeling solution containing a released photosensitive film suspension transported from the developing or peeling device,

means for transporting the developing or peeling solution from said developing or peeling device to said solution tank,

at least one reagent tank for storing separately at least one reagent for regenerating the developing or peeling solution,

means for transporting the at least one reagent to said solution tank from said at least one reagent tank,

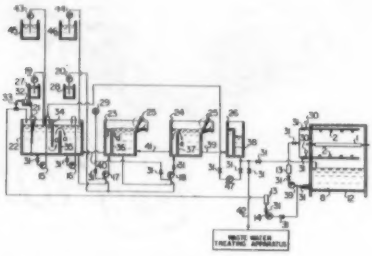
a blower for supplying a gas to the developing or peeling solution,

at least one floating tank,

means for transporting an admixture of the developing or

peeling solution and said at least one reagent to the at least one floating tank,

means for directing the gas from said blower to said at least one floating tank, wherein the released photosensitive film suspension suspended in the developing or peeling solution transported from the solution tank in said admixture is flocculated with the at least one reagent from the at least one reagent tank and with the gas from the blower to produce a flocculated deposit,



means for removing the flocculated deposit in a floating state from the at least one tank,

means for discharging at least a portion of the resulting treated developing or peeling solution to a waste water treating apparatus, and

means for recycling the remaining portion of the treated developing or peeling solution to the developing or peeling device.

4,519,691

PHOTOGRAPHIC TAKING LENS DRIVING MEANS

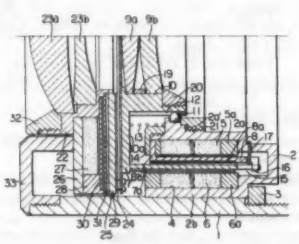
Minoru Yamada; Eiji Ito, and Masaru Nagai, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Mar. 2, 1984, Ser. No. 585,768

Claims priority, application Japan, Mar. 4, 1983, 58-35636; Mar. 4, 1983, 58-35637; Mar. 4, 1983, 58-35638; Mar. 4, 1983, 58-31289[U]; Mar. 4, 1983, 58-31290[U]

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—400 **8 Claims**



1. A taking lens driving means comprising permanent magnet means provided fixedly inside of a lens barrel,

a plurality of movable coil members arranged so as to traverse magnetic flux of a magnetic circuit formed of said permanent magnet means and to surround the circumference of the taking lens,

wherein at least one of the movable coil members is for driving the taking lens unit, and the rest thereof are for regulating the movable range of the movable coil member for driving the taking lens unit.

4,519,692

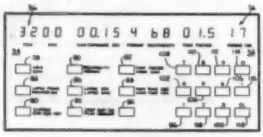
EXPOSURE AND CAMERA CONTROL

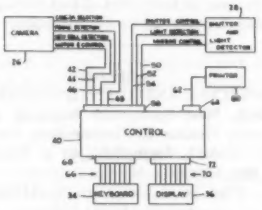
John K. Michalik, Sloan, N.Y., assignor to Warner-Lambert Technologies, Inc., Southbridge, Mass.

Filed Apr. 8, 1983, Ser. No. 483,455

Int. Cl.³ G03B *7/093*

U.S. Cl. 354—412 **15 Claims**





1. An exposure and camera control system comprising:

(a) means for providing information relating to film parameters and camera type;

(b) light to frequency converter means for providing pulse signals having a frequency proportional to the intensity of light to be used in exposing camera film; and

(c) control means operatively connected to said information providing means and to said light to frequency converter means for calculating exposure time and for providing signals for controlling film exposure to light and signals for controlling film transport when the exposure is complete.

4,519,693

DEVICE FOR TRANSFERRING PARTICULATE MATERIAL

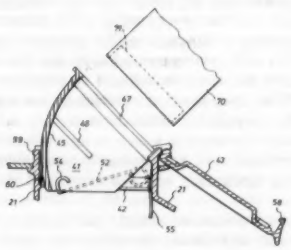
Anthony J. Skeels, Hitchin, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Sep. 19, 1983, Ser. No. 533,465

Claims priority, application United Kingdom, Sep. 21, 1982, 8226824

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—3 DD **12 Claims**



1. An apparatus for transferring particles from a refill container into an open ended hopper, including:

means for closing the open end of the hopper; and

means for guiding particles from said refill container into said hopper, said guiding means being positioned interiorly of the hopper when said closing means closes the open end of the hopper and moving, in response to said closing means being moved to open the open end of the hopper, to an exterior position for receiving the refill container with the surface of said guiding means having a surface in engagement with the refill container and the surface being inclined to the horizontal so that the refill container does not have to be completely inverted when discharging particles into the hopper.

4,519,694

PROJECTION APPARATUS FOR AUTOMATIC CORRECTION OF NON-UNIFORM ILLUMINANCE DISTRIBUTION IN IMAGE AREA OF IMAGING PLANE

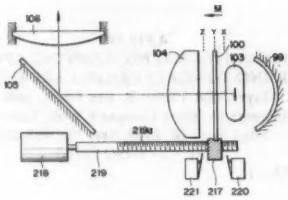
Kazuo Kashiwagi, Tokyo, and Takao Toda, Shinagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,581

Claims priority, application Japan, Jul. 2, 1982, 57-113984; May 23, 1983, 58-90200

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—5 **38 Claims**



1. A projection apparatus comprising:

a source of light for illuminating an original to be projected which is located at an illuminating position;

optical means for imaging the original illuminated by said source of light on a projection plane;

first measuring means for measuring, without the original at the illuminating position, the amount of light passing near the center of an optical path defined by said optical means;

second measuring means for measuring, without the original at the illuminating position, the amount of light passing near the marginal area of said optical path;

illuminance correcting means for changing a distribution of illuminance on said projection plane; and

control means for controlling said illuminance correcting means in accordance with the measurements of said first and second measuring means to correct non-uniform distribution of illuminance.

4,519,695

IMAGE DENSITY CONTROL METHOD FOR ELECTROPHOTOGRAPHY

Kazuo Murai, and Yutaka Hasegawa, both of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 7, 1983, Ser. No. 464,455

Claims priority, application Japan, Feb. 12, 1982, 57-20731

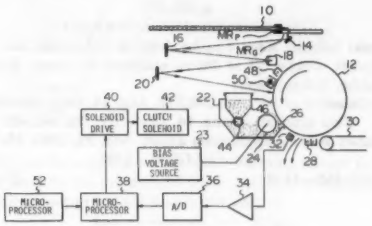
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 R **4 Claims**

1. A method of controlling an image density in electrophotography by controlling at least one of various image density parameters in response to values detected from different pattern areas, the image density parameters including an amount of charge deposited on a photoconductive element by a charger, bias voltage for development, toner concentration in a developer, rate at which toner is supplied to the developing unit and image transfer potential, comprising the steps of:

(a) forming at least two pattern areas having different potentials on the surface of the photoconductive element by at least one of various means for forming charge patterns which include controlling the energization of the charger, controlling an illuminating lamp and projecting an image pattern;

(b) producing in digitized form in different ranges respectively assigned to the two pattern areas, at least one of values associated with an image density which include a surface potential of the pattern area before development, toner density of the pattern area after development, sur-



face potential of the pattern area after development and image density of an area of a transferred image which corresponds to the pattern area;

(c) comparing the digitized data of the different patterns and, based on the result of the comparison, setting up correspondence of the values associated with image density to a relation in magnitude between the digitized data and;

(d) controlling said at least one image density parameter in accordance with a predetermined function based on the result of said comparison performed in step (c).

4,519,696

XEROGRAPHIC COPYING APPARATUS

Jan J. Bruyndonckx, Hove, and Jacobus H. Bosschaerts, Mortsel, both of Belgium, assignors to AGFA-Gevaert N. V., Mortsel, Belgium

Filed Feb. 9, 1983, Ser. No. 465,286

Claims priority, application United Kingdom, Feb. 11, 1982, 8204033

Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 D **7 Claims**

1. Xerographic copying apparatus including an image development station having a developer applicator section in which a free-flowing xerographic developer mixture comprising ferromagnetic particles and non-ferromagnetic toner powder is contacted with the image to be developed for attraction of said toner powder to said image to render the same visible, a toner supply section containing a supply of toner powder, and toner feed means between said sections and operable to deliver additional toner powder from said supply section to said applicator section to replenish the toner powder in said developer mixture, and means for monitoring the concentration of toner powder in said mixture and operating said toner feed means upon significant changes in said concentration, said monitoring means comprising a first induction coil mounted on said applicator section so that the magnetic field of said coil traverses a portion of the developer mixture in said applicator section and its self-inductance changes with changes in the concentration

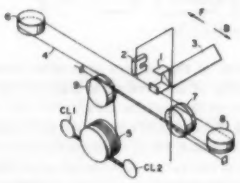
of ferromagnetic particles in said mixture, a second induction coil mounted at said development station so that it is exposed to the same environmental temperature conditions as the first coil but with its magnetic field prevented from traversing said developer mixture, an AC bridge circuit in which first and second induction coils are connected in a first and a second arm of the circuit, an AC source for feeding said bridge circuit, and detecting means for detecting and signalling relative variations in the AC voltages across said first and second induction coils.

4,519,697

IMAGE FORMING APPARATUS

Hiroaki Takeda; Kano Tanaka, both of Yokohama, and Shinji Murata, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 293,879, Aug. 18, 1981, abandoned.
This application Aug. 14, 1984, Ser. No. 641,403
Claims priority, application Japan, Aug. 25, 1980, 55-116850
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 R **23 Claims**



1. An image forming apparatus, comprising:

scanning means for scanning an original, and having a reciprocating member;

driving means for causing said reciprocating member to move in a forward direction for original scanning and in a reverse direction; and

control means for controlling said driving means to position said reciprocating member at a predetermined position, regardless of whether said reciprocating member is at the predetermined position, before the performance of an image forming operation, by a setting operation involving movement of the reciprocating member in both the forward and the reverse directions, said control means being arranged to determine, as an improper state of said apparatus, the failure of said reciprocating member to become positioned by the setting operation at the predetermined position.

4,519,698

IMAGE FORMING APPARATUS INCLUDING A CLEANING BLADE AND DRUM LUBRICANT

Mitsuaki Kohyama, Tokyo, and Kenshi Toshimitsu, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Aug. 25, 1982, Ser. No. 411,363
Claims priority, application Japan, Sep. 3, 1981, 56-138815
Int. Cl.³ G03G *21/00*; F16N *15/00*; B05C *11/105*; E21B *10/22*
U.S. Cl. 355—15 **13 Claims**

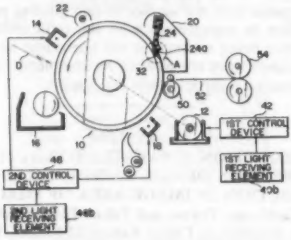
1. An image forming apparatus comprising:

a rotatable photosensitive body including an outer circumferential surface having a recess for holding a lubricant therein at a part thereof, said recess being formed to extend from one side to the other side of said outer circumferential surface;

driving means for rotating said photosensitive body;

a cleaning blade for removing a residual developer on said outer circumferential surface upon contact therewith, said cleaning blade having an edge portion which extends from said one side to said the other side of said outer circumferential surface, said edge portion being in contact with said outer circumferential surface of said photosensitive body, said cleaning blade being capable of falling into said recess; and

feeding means for feeding any lubricant held in the recess to



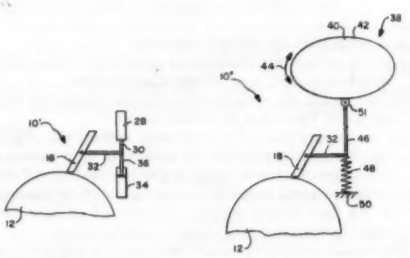
part of the outer circumferential surface of said photosensitive body which is brought into contact with said cleaning blade to form a thin film of lubricant upon contacting with any lubricant held in said recess as said photosensitive body is rotated.

4,519,699

ELECTROPHOTOGRAPHIC COPYING APPARATUS INCLUDING TONER CLEANING ARRANGEMENT

Edward F. Mayer, and Victor B. van Blerk, both of San Jose, Calif., assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,464
Int. Cl.³ G03G *21/00*
U.S. Cl. 355—15 **4 Claims**



1. In an electrophotographic copying apparatus including a rotating photoconductive drum, means for placing an electrostatic image corresponding to an original to be copied on the outer circumferential surface of the drum, means for applying toner to said image bearing surface in order to develop said image with said toner, and means for transferring the applied toner from said drum surface to a blank sheet of paper so as to transform the latter into a copy of said original, the improvement comprising an arrangement for cleaning residue toner from said drum surface immediately after said copy has been made, said arrangement including:

(a) means adapted to engage said drum surface directly as the latter rotates so as to wipe any residue toner from the engaged surface;

(b) means supporting said wiping means for movement between a first position in direct engagement with said drum surface and a second position out of engagement therewith; and

(c) means acting on said supporting means for moving said wiping means between said first and second positions at a controlled speed throughout its movement between these positions, whereby to be able to prevent the wiping means from moving too fast and possibly cause residue toner to

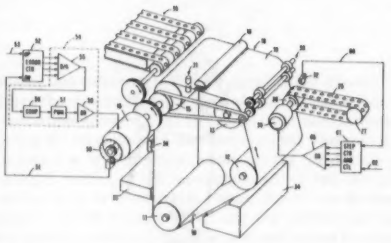
be thrown into the immediate surroundings inadvertently, said moving means including a piston type member, means for moving said member back and forth along a straight line path and means for damping the speed of movement of said member in a controlled way, said piston type member and said means for moving it together forming a solenoid and wherein said damping means is a dashpot connected with said member in a way which dampens its back and forth movement in said precontrolled way.

4,519,700

ELECTRONICALLY GATED PAPER ALIGNER SYSTEM

Robert B. Barker, Raleigh, N.C.; Ronald V. Davidge, Delray Beach, Fla.; David K. Gibson, and George W. Van Cleave, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 28, 1983, Ser. No. 566,236
Int. Cl.[3] G03G *15/00*
U.S. Cl. 355—3 SH 14 Claims



1. A sheet handling device adapted to feed sheets in synchronism with an image on the surface of a moving photoconductor comprising:

conveying means operable to transport sheets along a predetermined path toward the photoconductor;

sensing means disposed relative to said predetermined path for generating a first signal representative of the passing of a sheet along said path;

means operable for generating a second signal corresponding to the location of an image zone on the photoconductor; and

controller means responsive to said first and second signals for controlling the velocity of said conveying means for synchronously engaging the sheet with the photoconductor image zone as the sheet exits said predetermined path.

4,519,701

SIDE PRINTING APPARATUS

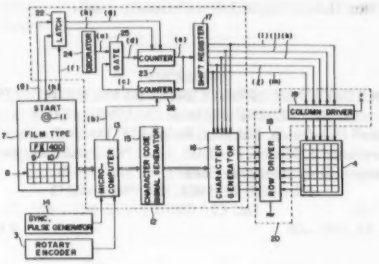
Takeshi Kanaoka, and Shigehisa Shimizu, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Dec. 6, 1983, Ser. No. 558,517
Claims priority, application Japan, Dec. 10, 1982, 57-215432
Int. Cl.[3] G03B *27/32, 27/52*
U.S. Cl. 355—39 9 Claims

1. A side printing apparatus for providing latent images of characters, numerals, symbols and the like on a photographic film moving in continuous motion by exposing it to light images produced by a light image forming device said apparatus comprising:

means for giving an indication of the film type of a photographic film to be provided with latent images thereon;

means for generating pulse signals having a pulse length in accordance with the film type indication from said means; and



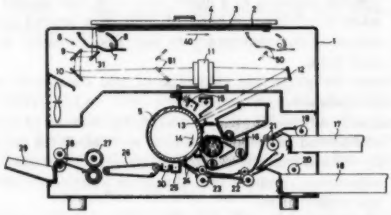
drive means for causing a light image forming device to be energized for a time defined corresponding to said pulse length so as to produce said latent images.

4,519,702

APPARATUS FOR REGULATING THE MOVEMENT OF A MOVABLE MEMBER

Yutaka Shigemura, Hyogo; Hiroshi Kimura, Osaka; Masahiko Hisajima, Osaka; Shinobu Satonaka, Osaka; Seiji Kaminaga, Chiba, and Mitsuya Ishito, Osaka, all of Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Oct. 21, 1983, Ser. No. 544,057
Claims priority, application Japan, Nov. 30, 1982, 57-210290
Int. Cl.[3] G03B *27/48, 27/50, 27/70*
U.S. Cl. 355—51 5 Claims



1. An apparatus for regulating the movement of a movable member, said apparatus comprising:

drive means for moving the movable member in a first direction from a rest position to an operative position and for moving the movable member in a second direction, opposite to said first direction, from said operative position toward said rest position;

first detecting means for detecting the presence of the movable member at said rest position;

second detecting means for detecting the presence of the movable member at a location adjacent said rest position but upstream thereof with respect to said second direction; and

control means, operatively connected to said drive means, said first detecting means and said second detecting means, for operating said drive means to move the movable member in said first direction and then in said second direction, for stopping said drive means upon detection of the movable member, moving in said second direction, at said location by said second detecting means, whereafter the movable member continues movement by inertia in said second direction from said location to said rest position and is detected thereat by said first detecting means, and for, if the movable member is not detected at said rest

position by said first detecting means within a predetermined time period after said detection by said second detecting means, again starting said drive means to move the movable member in said second direction until detection thereof by said first detecting means.

4,519,703

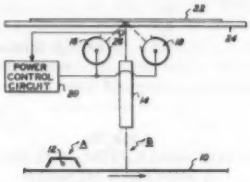
DOCUMENT REPRODUCTION DEVICE UTILIZING A SELECTIVE COLOR ILLUMINATOR

Richard F. Lehman, Fairport; Roland W. Porth, Rochester, and Lawrence J. Mason, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jul. 15, 1983, Ser. No. 514,372

Int. Cl.³ G03B *27/72*

U.S. Cl. 355—69 **4 Claims**



1. A document reproduction device including an illumination system for illuminating an original document lying in an object plane;

said illumination system comprising a first and second lamp placed on opposite sides of a scan strip on said object plane;

said first lamp adapted to direct a band of light of a first spectral emission to a linear scan strip, said second lamp adapted to direct a band of light of a second spectral emission, complementary to said first emission, to said scan strip;

means for projecting an image of said document onto a photosensitive image plane;

manually adjustable means for adjusting the ratio of said first and second lamp emissions so as to enhance the copyability of a document dominated by a specific color, said adjustment resulting in a change in illumination level at said object plane;

a photosensor for detecting the illumination level at said object plane and for generating an output signal representative of a change of said level; and

electrical means responsive to said photosensor output signal to adjust the power input to said lamps so as to maintain a desired illumination level.

4,519,704

MEASUREMENT OF OPTICAL REFRACTIVE INDEX PROFILES

Robert J. Mansfield, Wallingford, Conn.; David N. Payne, Southampton, England, and Issei Sasaki, Sapporo, Japan, assignors to National Research Development Corporation, London, England

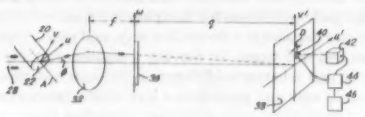
Filed Mar. 18, 1983, Ser. No. 476,465

Claims priority, application United Kingdom, Mar. 18, 1982, 8207968

Int. Cl.³ G01N *21/41*

U.S. Cl. 356—73.1 **13 Claims**

1. A method of measuring radial variations in the refractive index of an approximately cylindrical, translucent object having a substantially plane end face and a substantially invariant refractive index in a direction parallel to its axis, comprising illuminating the end face by means of a collimated beam of light incident at an angle to the cylindrical axis which differs substantially from 90 degrees and measuring at a plurality of



radial positions the refractive angle at which light leaves the end face.

4,519,705

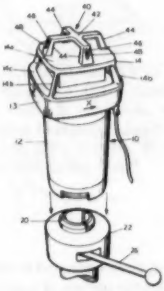
SIGHTING CAP FOR ROTATING LASER BEAM TRANSMITTER

Robert J. P. Morrow, Huber Heights, Ohio, assignor to Spetra-Physics, Inc., Mountain View, Calif.

Filed Sep. 16, 1982, Ser. No. 418,650

Int. Cl.³ G01B *11/26*

U.S. Cl. 356—138 **7 Claims**



1. In a rotating laser beam transmitter having a housing unit angularly adjustable about a generally vertical axis of rotation of the laser beam and means for adjusting the vertical angular position of the axis of rotation of the laser beam relative to two fixed horizontal axes in the housing, the improvement comprising: a cap for said housing including a horizontal base plate portion having at least one pair of opposed, vertical legs; means for securing said cap to the top of the transmitter housing with said legs in diametrically opposed relationship to the axis of rotation and in parallel alignment to one of said fixed axes; each pair of said legs respectively defining diametrically aligned vertical sighting slots in parallel alignment with said fixed axis, whereby sighting through said slots at a remote sighting post facilitates angular adjustment of the housing so that said fixed axes are parallel to the surveyed axes of the work area.

4,519,706

SPECTROPHOTOMETER HAVING WAVELENGTH SELECTING STRUCTURE

Peter Morley, Newmarket, and Peter J. Little, Malmesbury, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 14, 1983, Ser. No. 458,123

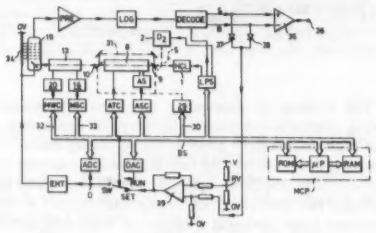
Claims priority, application United Kingdom, Jan. 19, 1982, 8201372

Int. Cl.³ G01J *1/42*; G01N *21/71*

U.S. Cl. 356—319 **12 Claims**

1. A spectrophotometer comprising a source of radiation, a monochromator arranged to receive radiation from the source, a detector for receiving a selected wavelength of radiation from the monochromator and producing a signal representa-

tive of the intensity of the radiation received, means for comparing the output of the detector with a reference value when the spectrophotometer is in a calibration mode and producing a control signal dependent on the comparison, means for feeding the control signal to a control input of the detector for controlling the gain thereof so as to cause its output to tend towards the reference value, means for storing said control signal, and means for applying the stored control signal to the control input of the detector when the spectrophotometer is in a measurement mode characterised in that the spectrophotometer is an atomic spectrophotometer and includes a source of



resonance line radiation, means for stepping the selected wavelength of the monochromator through the resonance line when the spectrophotometer is in the calibration mode, means for detecting the magnitude of the control signal when the gain of the detector is at a minimum value, means for detecting the wavelength setting of the monochromator when the gain of the detector is at a minimum value, means for storing the magnitude of the control signal and the wavelength setting which give the minimum detector gain, and means for applying the stored control signal to the detector and the stored wavelength setting to the monochromator when the spectrophototmeter is in the measurement mode.

4,519,707

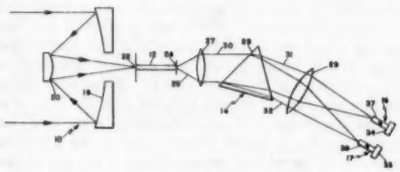
MULTI-SPECTRAL TARGET DETECTION SYSTEM WITH COMMON COLLECTING MEANS

Fernand B. Kuffer, Brea, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Jan. 31, 1983, Ser. No. 462,249

Int. Cl.³ G01J *3/14*

U.S. Cl. 356—326 **4 Claims**



1. A multi-spectral detection system for detecting radiation from a single target feature within frequency bands that are in diverse portions of the electromagnetic spectrum, comprising

common radiant energy collection means for collecting radiant energy of different width wavelength bands from a single target feature in said diverse portions of the electromagnetic spectrum and focusing said collected energy to a common focal point,

imaging means for dispersing said collected energy into separate beams having spectral regions respectively corresponding to said diverse portions of the electromagnetic spectrum, with the beams being of uniform cross-sectional dimension notwithstanding said different widths, and for focusing the separate beams to a common plane for detection by separately positioned detections means; and

separate detection means of uniform cross-sectional area positioned in the common plane for respectively detecting energy in the separate spectral regions of the separate beams.

4,519,708

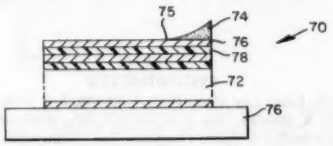
MODE DISCRIMINATION APPARATUS

Michael S. Perlmutter, Sherborn, and Kenneth H. Braun, North Billerica, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed May 20, 1981, Ser. No. 265,712

Int. Cl.³ G01C *19/64;* H01S *3/05*

U.S. Cl. 356—350 **28 Claims**



1. In combination:

an electromagnetic wave ring resonator for supporting an electromagnetic wave having a fundamental resonant mode disposed along an axis of said resonator and higher order resonant modes displaced from said axis;

means disposed in said resonator having absorptive material displaced from said axis for absorbing energy of said higher order resonant modes; and

said absorptive material means comprising a dielectric mirror with an absorptive material deposited on at least a portion of said mirror for suppressing said unwanted resonant modes.

4,519,709

PHOTOELECTRIC INCREMENTAL LENGTH OR ANGLE MEASURING DEVICE

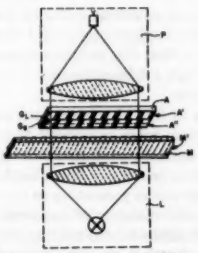
Gunther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Nov. 19, 1982, Ser. No. 443,063

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1981, 3148910

Int. Cl.³ G01B *11/00, 11/02*

U.S. Cl. 356—373 **13 Claims**



1. In a photoelectric, incremental path measuring device of the type comprising illuminating means for generating collimated illuminating light of wavelength λ; a measuring scale which defines a measurement grid having a predetermined grid constant g; a scanning plate which defines at least one scanning grid having the same grid constant as the measurement grid;

said measurement grid being separated from the at least one scanning grid by a distance $a=kg^2/\lambda$, the improvement comprising:

k is a number in the range between about 0.0 and about 0.3;

one of the measurement and scanning grids comprises alternating light grid lines and dark grid lines of selected widths in which the ratio between the light grid line width and the dark grid line width is greater than 2:1; and

said measurement grid oriented parallel to said scanning grid.

4,519,710

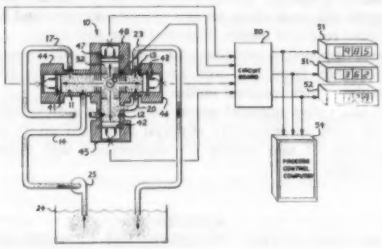
COLORIMETER

Robert S. Luce, Los Altos; Ross A. Quinn, Los Altos Hills, and Leroy S. Rowley, San Jose, all of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.

Filed Mar. 21, 1983, Ser. No. 477,226

Int. Cl.³ G01J *3/50*

U.S. Cl. 356—411 **13 Claims**



1. A colorimeter for continuously measuring concentration of an ionic species in an aqueous solution, said colorimeter comprising:

(a) a source of optical radiation;

(b) a plurality of flow chambers through which a sample of said solution can pass, said flow chambers being interconnected so that said sample of said solution passes through each of said flow chambers in succession, each of said flow chambers admitting radiation from said source into said sample simultaneously, said flow chambers being configured so that said radiation from said source is transmitted through a different quantity of said sample in each flow chamber;

(c) a plurality of first photodetectors, each one of said first photodetectors being responsive to intensity of radiation from said source transmitted through said sample in a corresponding one of said flow chambers, each one of said first photodetectors generating an electrical output indicative of the concentration of said ionic species in said sample of said solution in said corresponding one of said flow chambers, electrical outputs from said plurality of first photodetectors being generated simultaneously;

(d) a second photodetector responsive to intensity of radiation emitted by said source; and

(e) electronic circuitry interconnecting said radiation source and said second photodetector, said circuitry maintaining the intensity of said radiation emitted by said source at a substantially constant value.

4,519,711

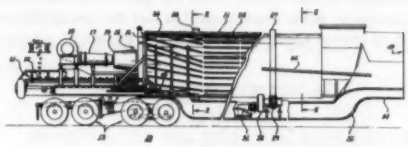
DRUM MIXER AND METHOD

Orval D. Gillen, Tempe, Ariz., and John G. Healey, Jr., Portland, Oreg., assignors to The Tanner Companies, Phoenix, Ariz.

Filed Mar. 27, 1980, Ser. No. 134,373

Int. Cl.³ B18C *5/46*

U.S. Cl. 366—4 **7 Claims**



7. The method of processing re-cycled bituminous road surfacing materials comprising the steps of generating a current of high temperature gases at the receiving end of a rotatable mixing drum, conveying raw bituminous material into the receiving end of said drum, spraying a curtain of water into the path of said raw material prior to exposure thereof to the high temperature gases, spraying a curtain of water into the current of high temperature gases, exposing said raw bituminous material to the current of high temperature gases after subjection thereof to said water curtain, and conveying the heated and mixed raw material to the discharge of said drum.

4,519,712

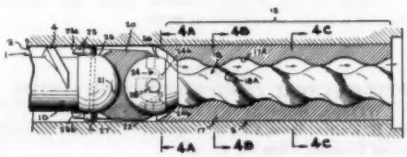
POSITIVE DISPLACEMENT PUMP ASSEMBLY

Robert A. Barr, P.O. Box 4476, Virginia Beach, Va. 23454

Filed Sep. 6, 1984, Ser. No. 648,040

Int. Cl.³ B29B *1/06*

U.S. Cl. 366—77 **8 Claims**



1. A screw extruder assembly for plasticating or melting solid plastic material or the like, comprising an elongated cylindrical barrel having an upstream end and an outlet end, a screw rotatably housed in an upstream portion of said barrel and having a feed end and a discharge end, said screw having a mixing section between the feed end and discharge end thereof comprising at least one pair of substantially parallel, helical, first and second threads integral with the core of said screw, said first thread of the pair originating at the feed end of said screw creating a helical channel and having a minimum clearance to said barrel, said second thread of the pair originating at a location about one-third to two-thirds of the length of said screw from the feed end of said screw by rising from the core of said screw and having a large clearance to said barrel comparable to or greater than the size of the components of said solid plastic material, said second thread of the pair dividing said helical channel created by said first thread into two sub-channels of substantially equal width, one located toward the feed end of said screw from said second thread and the other located toward the discharge end of said screw from said second thread, the depth of the sub-channel located toward the feed end gradually increasing to a maximum comparable to the depth of said helical channel at the feed end of said screw accompanied by gradual decrease of the depth of the other sub-channel to a minimum comparable to or greater than the size of the components of said solid plastic material, a positive

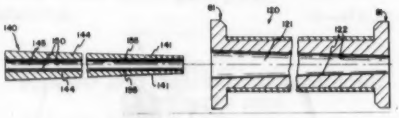
displacement Moineau type pump in said barrel located between the discharge end of said screw and said outlet end, said pump having a stator member and a rotor member rotatable in the stator member, the stator member having a hollow cavity therethrough accommodating said rotor member and the stator cavity and rotor exterior having confronting surfaces of developed helical contours providing helical threads of wide rounded form, said confronting surfaces being always in contact with each other at any cross-section defining a series of pumping pockets which progress longitudinally through the pump, the number of threads on said rotor exterior being less than the number of 40 threads in the stator cavity surface, and coupling means interconnecting the discharge end of said-screw to said rotor member to drive the latter from said screw to provide reduced pressures at said discharge end and provide pumping force to increase downstream process restrictions to flow.

4,519,713

APPARATUS AND METHOD FOR RELINING EXTRUDER BARRELS

H. Dean Godsey, Palatine; Donald F. Schoen, Barrington, and Joseph F. Turek, Hanover Park, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Mar. 21, 1983, Ser. No. 477,187
Int. Cl.³ B01F *7/08*
U.S. Cl. 366—79 **6 Claims**



1. In an extruder of the screw type, having an elongated barrel and impeller means, said barrel having a feed end and a discharge end and a passageway therebetween, said impeller means comprising a drive means and an elongated screw snugly and rotatably residing within said passageway, the improvement wherein said barrel consists of a relinable assembly comprising:

a. an elongated rigid housing having an elongated tapered bore therethrough, wherein the cross-section diameter of the bore is larger toward the feed end of the barrel and tapers to a smaller cross-section diameter at the discharge end;

b. a rigid elongated sleeve liner, having a tapered exterior surface and a wear and/or corrosion resistant interior surface defining said passageway, wherein the exterior surface of the sleeve liner is shaped to fit closely within the tapered bore of the housing, and wherein the sleeve liner axially mates within the tapered bore of the housing to a substantially contiguous line-to-line fit at an interface between the interior tapered surface of the housing bore and the tapered exterior surface of the sleeve liner, and wherein, when the sleeve liner is mated within the tapered bore, the wear and/or corrosion resistant interior surface is uniformly centered around the screw; and

c. means for removably securing the sleeve liner within the housing.

4,519,714

WASTE MATERIAL AGITATOR

Warren K. Johnson, Alexandria; Michael R. Goettsch, Glenwood, and Archie H. Olson, Alexandria, all of Minn., assignors to Glenwood Manufacturing Corporation, Glenwood, Minn.

Filed Jun. 4, 1984, Ser. No. 617,114
Int. Cl.³ B01F *7/06*
U.S. Cl. 366—285 **10 Claims**

1. An apparatus for agitating a fluid containing a sludge-like material stored in an enclosure having a floor and side walls, the apparatus comprising:

an elongated frame having a longitudinal axis and a lower floor-engaging guard portion defining an enclosure and an upper end portion;

means for agitating the fluid containing the sludge-like material pivotally attached to the frame within the guard portion;

pivotal mounting means for mounting the means for agitating such that the means for agitating is positionable in a generally vertical direction between a first position sub-

stantially along the longitudinal axis of the elongated frame and a second upward position angularly spaced from the first position; and

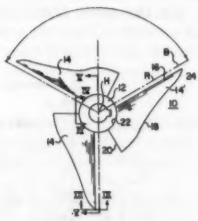
control means for controlling the pivotal movement of the means for agitating attached to the frame and including a control mechanism situated proximate the upper end portion of the frame and a linkage assembly extending along the elongated frame and pivotally connected to the control mechanism at one end and pivotally attached to the agitating means at another other end so that the agitating means is positionable between the first and second position through manipulation of the control mechanism.

4,519,715

PROPELLER

Robert A. Golobic, and Michael H. Scott, both of Colorado Springs, Colo., assignors to Joy Manufacturing Company, Pittsburgh, Pa.

Continuation of Ser. No. 326,084, Nov. 30, 1981, abandoned.
This application Nov. 17, 1983, Ser. No. 552,857
Int. Cl.³ B01F *7/22*
U.S. Cl. 366—343 **10 Claims**

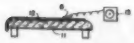


1. A propeller comprising a hub rotatable about a hub axis H and a plurality of blades affixed to said hub, each said blade including a straight leading edge and a concavo-convex trailing edge, each said blade being a portion of a cylindrical segment having an axis B, said axis B intersecting said axis H, said straight leading edge and lineal extensions thereof being parallel to said axis B and non-intersecting with said hub axis H and being spaced, with respect to the direction of rotation, behind a radius extending outwardly from said axis H which radius is parallel to and in the same plane as said straight leading edge.

4,519,716
DEVICE FOR TESTING COMBUSTABILITY

Shigeru Suga, 20-2 Yoyogi 5-chome, Shibuya-ku, Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,456
Int. Cl.[3] G01N *25/00*
U.S. Cl. 374—8 15 Claims



1. A device simulating the burning of an elongated smoking product for testing the combustability of an article, comprising:

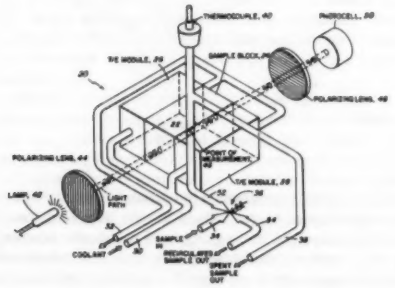
a rod-shaped resistive heating element having a first end and a second end opposite said first end, the length and cross section of which are the same as those of a product whose burning characteristics are to be simulated; and

means for applying an electric current through successively adjacent portions of said heating element along the length thereof, one portion at a time, for respective predetermined periods of time, beginning at said first end and ending at said second and, such that the temperature of the portion to which the electric current is being applied is approximately equal to a normal burning temperature of the product whose burning characteristics are being simulated.

4,519,717
ON-STREAM CLOUD POINT ANALYZER

Hugh D. Jones, Chicago, and Steven J. Martinich, Wheaton, both of Ill., assignors to GCA Corporation, Bedford, Mass.

Filed Jun. 7, 1982, Ser. No. 385,936
Int. Cl.[3] G01N *21/17, 25/12*
U.S. Cl. 374—17 6 Claims



1. Cloud point analyzer apparatus of the type having a cooling module for cooling a sample at variable cooling rates in accordance with a variable cooling power input, a sample cell for liquid hydrocarbons mounted in said cooling module, sensor means for producing an electrical sensor output indicative of the optical properties of the sample characteristic of cloud point, thermocouple means for producing an electrical output indicative of the temperature of said sample in said cell, and means for recording a value corresponding to said thermocouple means output, wherein the improvement comprises

means responsive to an change in the level of said sensor output for issuing a cloud point detection signal,

means responsive to said detection signal for automatically discharging a given liquid hydrocarbon sample and recharging the sample cell with a new sample, and

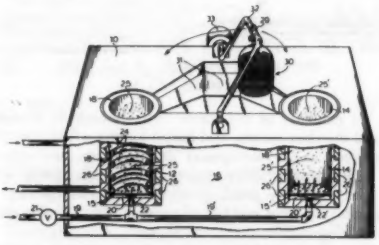
control means for automatically adjusting the cooling power input to a new fixed level after each sample if a time interval between initial charging of the previous sample and cloud point detection is outside a predetermined range so as to bring said time interval within said range,

whereby said time interval is controlled by said control means adjusting a discrete power input level from sample to sample.

4,519,718
METHOD AND APPARATUS FOR THERMAL TESTING

H. Kenneth Staffin, Colonia; Robert B. Roaper, Martinsville, and Karin S. Bickford, Plainsboro, all of N.J., assignors to Procedyne Corp., New Brunswick, N.J.

Filed Jul. 23, 1982, Ser. No. 401,090
Int. Cl.[3] F26B *17/10*
U.S. Cl. 374—45 5 Claims



1. A device for thermal testing, which comprises:

a first enclosure for an expanded mass of solid particles suspended in a fluidizing gas that behaves like a liquid;

a second enclosure for an expanded mass of solid particles suspended in a fluidizing gas that behaves like a liquid;

a least one temperature adjustment means provided for controlling the temperature of each enclosure;

a support means for supporting a workpiece in one of the first or second enclosures and adapted to transfer the workpiece from one enclosure to the other;

an agitating means affixed to the support means for agitating the support means in order to increase turbulence in the vicinity of the workpiece.

4,519,719
EARTH BORING BIT WITH PRESSURE COMPENSATING BEARING SEAL

Bruce H. Burr, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Filed Dec. 9, 1983, Ser. No. 559,651
Int. Cl.[3] F16C *33/74*
U.S. Cl. 384—94 12 Claims

1. An earth boring bit with an improved pressure compensating seal assembly, which comprises:

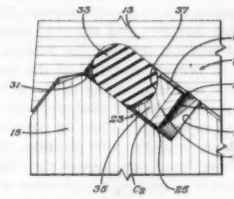
a body,

a cantilevered bearing shaft extending obliquely inwardly and downwardly from the body;

a cutter secured for rotation about the bearing shaft;

a seal groove between the cutter and the shaft to have generally circumferential walls, one on the cutter and the other on the shaft, and generally radial, inner and outer end walls;

a seal ring disposed in the seal groove opposing and sealingly enaging both the circumferential walls as well as opposing selected end wall;



an axially movable, rigid ring disposed in the seal groove between the seal ring and the other of said end walls;

spring means positioned between said other end wall and the rigid ring;

lubricant in passages and spaces in the bit, including those between the cutter and the shaft;

the axial displacement of the seal ring within the seal groove being resisted by the rigid ring to limit distortions of the seal ring.

4,519,720

PROCESS AND ARTICLES FOR REMOVING TYPEWRITER INKS

Duane F. Merrill, Ballston Spa, N.Y., assignor to General Electric Company, Waterford, N.Y.

Division of Ser. No. 418,338, Sep. 15, 1982,. This application Jul. 20, 1984, Ser. No. 632,760

Int. Cl.³ B41J *33/00*

U.S. Cl. 400—241 **25 Claims**

1. A method for removing vertically cohesive ink from a substrate comprising the steps of:

(a) contacting a pressure sensitive adhesive side of an ink removing article comprising a silicone pressure sensitive adhesive composition applied to a backing material and cured thereon against a vertically cohesive ink disposed on a substrate, said pressure sensitive adhesive composition being the co-condensation reaction product of a mixture containing 100 parts by weight of a trimethyl chain-stopped MQ resin having an M to Q ratio ranging from 0.5 to 1.0:1 and 44 to 57 parts by weight of a dimethylpolysiloxane gum having a penetration ranging from 500 to 1,200 millimeters at 25° C.; and

(b) applying pressure to said backing material to effect transfer of the vertically cohesive ink from said substrate to said ink-removing article and wherein the adhesive has a greater affinity for the vertically cohesive ink than for the substrate and has a greater internal cohesion than external adhesion.

11. A method for making an ink-removing article comprising the steps:

(a) applying to a backing material a silicone pressure sensitive adhesive composition which is the co-condensation reaction product of a mixture containing 100 parts by weight of a trimethyl chain-stopped MQ silicone resin having an M to Q ratio ranging from 0.5 to 1.0:1 and 44 to 57 parts by weight of a dimethylpolysiloxane gum having a penetration ranging from 500 to 1,200 millimeters at 25° C.,

and

(b) curing said silicone pressure sensitive adhesive composition to said backing material in the presence of a catalyst and wherein the adhesive has a greater affinity for the vertically cohesive ink than for the substrate and has a greater internal cohesion than external adhesion.

4,519,721

TYPEWRITER KEYBOARD LAYOUT

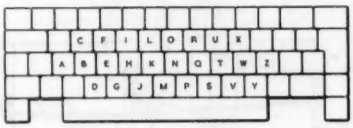
Kathleen E. Gardner, 73 Macclesfield Old Rd., Burbage, Buxton, England

Filed Jul. 5, 1983, Ser. No. 510,880

Claims priority, application United Kingdom, Jul. 3, 1982, 8219299; Dec. 30, 1982, 8236975

Int. Cl.³ B41J *5/10*

U.S. Cl. 400—472 **2 Claims**



1. A typewriter comprising a keyboard having a plurality of keys divided into three substantially horizontal rows, between which keys letters of the alphabet are allocated, and means operative by the keys to write the letters of the alphabet, wherein the twenty six alphabet letter keys are divided into a middle row of ten keys and a top row and a bottom row each of eight keys, and wherein the first key, from left to right, of the middle row is the only alphabet letter key required to be operated by the little finger of the left hand of the operator, is allocated the letter A, and the last key, from left to right, of the middle row, is the only alphabet letter key required to be operated by the little finger of the right hand of the operator, is allocated the letter Z, with the keys being arranged in two group of thirteen with the keys in the left hand group being allocated the letters A to M and the keys in the right hand group being allocated the letters N to Z, and the middle eight keys of the middle row defining with the eight keys in each of the top and bottom rows eight groups of three keys arranged from left to right between the first and last keys of the middle row and with the first group adjacent the first key of the middle row allocated the letter A being allocated the first three letters of the alphabet following the letter A and each subsequent group of three keys, from left to right, being allocated the next three letters of the alphabet following the last letter of the alphabet in the immediately preceding group with the most frequently used letters E T A N H all being allocated to keys in the middle row and certain of the next most frequently used letters I O S R L being allocated to keys normally stroked by the right or the left index finger of the operator.

4,519,722

REGULATING WHEELHEAD DRIVE

William E. Shank, and Kenneth K. Bercaw, both of Waynesboro, Pa., assignors to Litton Industrial Products, Inc., Waynesboro, Pa.

Filed Sep. 3, 1982, Ser. No. 414,846

Int. Cl.³ F16B *2/00;* **F16D** *3/04*

U.S. Cl. 403—26 **1 Claim**

1. A centerless grinder comprising

a machine frame including bearing means for supporting a shaft and a portion having a bore defined therein

a regulating wheelhead drive including

a main drive shaft including

a first shaft portion adapted to be supported by said bearing means,

a second threaded shaft portion axially adjacent said first shaft portion, and

a third shaft portion extending through said bore, said third portion axially adjacent said second threaded

portion and tapered inwardly toward said second shaft portion,

a clamping ring having

a threaded inner diameter for threadedly engaging with said second threaded shaft portion, and

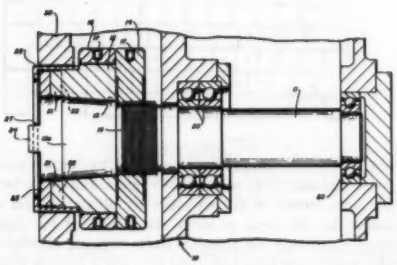
a plurality of holes defined in the outer diameter thereof for engagement by a suitable tool for rotating the clamping ring,

a drive coupling having

a tapered bore defining a surface for mating engagement with said tapered third shaft portion, and

a threaded outer diameter, and

drive lugs on the end remote from said first shaft portion, and



a locking ring having

a threaded inner diameter for threadedly engaging the threaded outer diameter of said drive coupling, and

a plurality of holes defined in the outer diameter thereof for engagement by a suitable tool for rotating the locking ring,

said locking ring being threadedly rotatable from a first position forcefully engaging and locking said clamping ring to a second position forcefully engaging the portion of the machine frame having said bore defined therein to break the frictional bond between said drive coupling and said tapered shaft portion.

4,519,723

CONNECTING DEVICE FOR RELEASABLY SECURING AN AXLE ON A SUPPORT PLATE

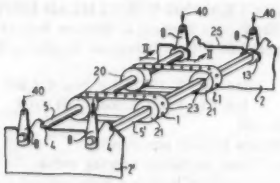
Hans Kusmierz, Gilching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Feb. 8, 1983, Ser. No. 464,913

Claims priority, application Fed. Rep. of Germany, Mar. 19, 1982, 3210024

Int. Cl.³ F16C *11/00*; B41J *15/00*; G03B *1/30*

U.S. Cl. 403—33 **8 Claims**



1. A connecting device for releasably securing an axle on a support plate particularly for supporting an axle of a component of a printing device, said connecting device comprising a bushing member having a bore for receiving the axle and supporting it for rotation; retaining means for preventing axial displacement of the axle in the bore of the bushing; support means being disposed on the support plate for receiving and supporting said bushing member, said support means comprising a substantially circular aperture of a given diameter adjacent an edge of the plate and connected to the edge by a throat having a dimension less than the given diameter of said aperture, said bushing member having a cylindrical body of said given diameter, said cylindrical body having at least one portion removed to provide a flat surface; a retaining lever being connected to said bushing member and extending relative to the flat surface so that with the retaining lever in one position, said bushing member can be passed through the throat of the aperture to enable insertion and removal thereof, said lever having a second position rotating the bushing member to a second position to prevent removal of the bushing member from said aperture; means including the lever for maintaining the bushing member in a desired axial position in the aperture; and said lever and support plate having coacting latch means for holding the lever in said second position, said latch means including one of said lever and support plate having a projection being received in an opening on the other of said lever and support plate, said lever being deflectable in a direction toward said axle to enable insertion of the projection into the opening.

4,519,724

SYSTEM FOR ELASTICALLY ASSEMBLING TWO PIECES

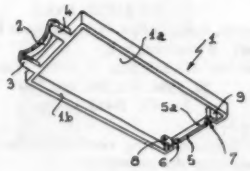
Jean L. Ribas, Lyons, France, assignor to Majorette, Caluire, France

Filed Jun. 20, 1983, Ser. No. 506,251

Claims priority, application France, Jun. 29, 1982, 82 11871

Int. Cl.³ B25G *3/00*

U.S. Cl. 403—345 **8 Claims**



1. A system for removably assembling two generally flat plate pieces having opposite ends having mutually opposed surfaces, comprising:

(a) on a first surface adjacent the end of the first piece, a first assembly element comprising a pair of lugs spaced apart transversely of the first surface and extending from the first surface toward the second piece, and a bar carried by the lugs and extending therebetween, the bar having an arcuate face which extends convexly toward the first surface and is spaced therefrom; and

(b) at the opposed end of the second piece, a second assembly element comprising a transverse flange extending at right angles from the plate and presenting an end surface to oppose said first surface of the first piece, the flange having a pair of transversely spaced notches extending therethrough and shaped to receive said lugs when the pieces are assembled with the flange located between said face of the bar and said first surface.

4,519,725

OFFSHORE STRUCTURE INCORPORATING A CONDUCTOR DEFLECTING SYSTEM

George E. Mott, Metairie, and Frederick J. Levert, Jr., Chalmette, both of La., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 22, 1983, Ser. No. 506,734

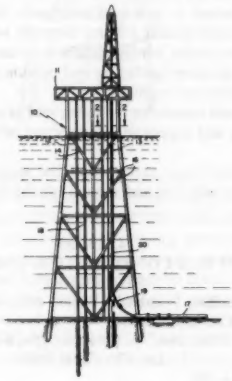
Int. Cl.³ E02B *17/00*; E21B *43/01*

U.S. Cl. 405—195 **6 Claims**

1. In an offshore structure 10 for operating from an embed-

ded position in a body of water to treat hydrocarbon fluids which are received from underwater pipelines, which structure includes; a deck holding hydrocarbon treating equipment, and at least one leg which extends between the floor of said body of water to the deck whereby to elevate the latter beyond the water's surface, the improvement therein of;

a multi-segment riser conductor means **20** depending from said structure embedded in the said floor, and including a plurality of riser guides **22** enclosed therein and vertically arranged to slidably register a downwardly moving riser **19**, in a substantially vertical dispostion, and



a riser deflector **26** forming an integral part of said riser conductor means and defining a plurality of multi-directional lateral openings for diverting risers outwardly from within the riser conductor means, and being spaced beneath said plurality of riser guides **22** and above said floor, whereby to engage the lower end of a downwardly moving riser **19** and to whereby urge the said lower end away from said vertical disposition, through a wall of said riser conductor and onto the said floor as the riser is progressively lowered.

4,519,726

FLOW LINE RISER FOR OFFSHORE STRUCTURE

John P. Knowles, Johnshaven; Steven A. Wheeler, Westhill, and Stewart D. Mitchell, Udny Green, all of Scotland, assignors to Texaco Limited, London, England

Filed Dec. 5, 1983, Ser. No. 557,786
Int. Cl.³ E02B *17/00;* E21B *7/12*
U.S. Cl. 405—195 **18 Claims**

1. The combination with a marine structure fixed to the floor of an offshore body of water and including; a jacket having a plurality of legs which support a deck above the water's surface, and a plurality of tubular conductor guides within said jacket to guide a drill string from the said deck into the ocean floor, the lower ends of said plurality of conductor guides being embedded in said ocean floor,

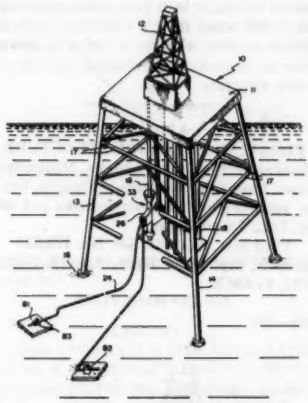
an insert member integral with at least one of said conductor guides and comprising:

a tubular casing disposed axially of said at least one conductor guide adjacent to the floor of said body of water,

a conduit deflecting shoe positioned in a wall of said casing to define transverse passages therethrough,

a compliant elongated conduit baffle assembly extending longitudinally of the said at least one conductor guide to define a plurality of discrete conduit passages which terminate upwardly from said transverse passages,

to permit registry of a flexible conduit which extends between the deck and the ocean floor into a discrete conduit passage,



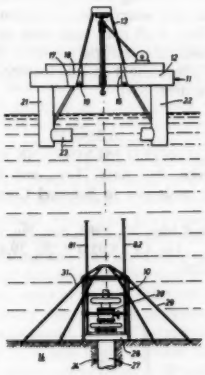
whereby to register in the respective conduit passages, a conduit which extends between said deck and the floor of the body of water.

4,519,727

OFFSHORE WELL HEAD PROTECTOR AND METHOD OF INSTALLATION

Stewart D. Mitchell, Udny Green, and Steven A. Wheeler, Westhill, both of Scotland, assignors to Texaco Limited, London, England

Filed Sep. 14, 1983, Ser. No. 531,884
Int. Cl.³ E02B *17/02;* E21B *33/037*
U.S. Cl. 405—204 **24 Claims**



1. A protective structure for encompassing an upstanding well head located at the floor of a body of water to preclude encounter between the well head and submerged objects which might be brought into damaging contact therewith, which structure includes;

an elongated open framework of structural members which defines a quasi-enclosed area adapted to surround the well head,

said open framework including a foundation sub-assembly which is supported at the ocean floor and having connecting flanges thereon,

at least one intermediate sub-assembly in engagement with

the foundation sub-assembly at said connecting flanges, and

at least one deflector element extending laterally from the uppermost of said at least one intermediate sub-assembly to rest at the ocean floor a sufficient distance from the foundation member whereby to define an upward sloping deflector surface which terminates at the upper end of the protective structure.

4,519,728

FLOATING OFFSHORE STRUCTURE

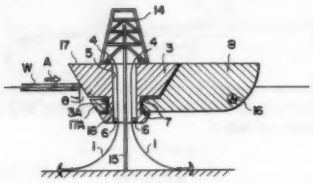
Masanao Oshima, Tokyo; Hitoshi Narita, Musashino; Nobuyoshi Yashima, Funabashi, and Hiroshi Tabuchi, Yokohama, all of Japan, assignors to Mitsui Engineering and Shipbuilding Company, Ltd., Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,327

Claims priority, application Japan, Apr. 16, 1982, 57-63628; Apr. 16, 1982, 57-63629

Int. Cl.³ B63B *35/08*

U.S. Cl. 405—224 **10 Claims**



1. A floating offshore structure having a floating body with a deck on an upper surface of the floating body and adapted to float while being moored at a fixed position on the sea, comprising:

a fore draft part being a front portion of the floating body, having near its water plane a circular horizontal section, said fore draft part being moored to the sea bottom; and

an after draft part being a rear portion of the floating body, having near said water plane a substantially smaller width than said fore draft part, said after draft part being connected to said fore draft part so as to be rotatable within a horizontal plane about an axis located about at the center of said fore draft part.

4,519,729

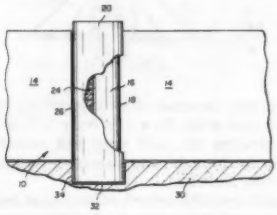
SEGMENTED MEMBRANE BARRIER

Robert T. Clarke, Jr., Katy, Tex., and Raymond Jasienski, Edison, N.J., assignors to Schlegel Corporation, Rochester, N.Y.

Filed May 10, 1983, Ser. No. 493,308

Int. Cl.³ E02D *5/20, 29/00*

U.S. Cl. 405—258 **14 Claims**



8. A barrier for underground fluid material flow control comprising:

a trench in the earth having a length extending across the expected polution path;

a segmented membrane barrier in said trench, said barrier comprising a plurality of membrane segments;

a first tubular joining member on one end of each of said segments, each of said first joining members comprising a tubular member attached to said segment along a continuous fluid impervious seam;

said tubular members characterized by a preselected inside dimension;

a second tubular joining member on the other end of each of said segments, each of said second joining members comprising a tubular member attached to said segment along a continuous fluid impervious seam;

a slot in a side wall of each of said first tubular joining members adapted to pass said membrane therethrough when said second tubular joining elrments are disposed within said first tubular joining members; at least said first tubular joining member having an end portion projecting beyond said membrane segments;

means in said trench for receiving said projecting portion for locating and supporting said second tubular joining member;

a fluid impervious sealing material disposed in the space between said first and second tubular joining members.

4,519,730

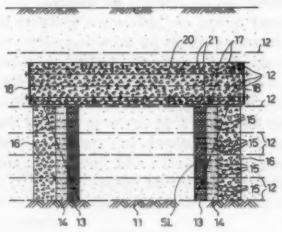
METHOD FOR CONSTRUCTING UNDERGROUND STRUCTURE

Kazuo Horimatsu, Funabashi, Japan, assignor to Tekken Construction Co., Ltd., Japan

Filed Jan. 20, 1984, Ser. No. 572,383

Int. Cl.³ E21D *9/00*

U.S. Cl. 405—258 **5 Claims**



1. A method of building a cavity structure in an embankment during its embanking work at a position corresponding to an existing road, water-way or the like in constructing a new road across said existing road or the like with said embankment, said method comprising the steps of forming at least slope layers of soil acting as side walls of an intended cavity to be later excavated for said structure, with a plurality of nets buried substantially horizontally in said layers as mutually vertically spaced and to intersect substantially sliding surfaces appearing in the layers when excavating said intended cavity, performing said embanking work with respect to peripheral portions of said slope layers, providing spaced supporting plates as opposed to each other respectively at each outer side position of a region right above the intended cavity when a required height for the cavity of the embankment is reached, providing prestressing wires between said plates, forming layers of at least crushed stone between the plates with a plurality of nets as spread therebetween and as mutually vertically spaced, tightening said prestressing wires to provide a prestress to said crushed stone layers between the plates, continuing the embanking work over said prestressed crushed stone layers and peripheral portions to complete the embankment, and excavating a zone defined by the slope layers and crushed layers to provide the cavity.

4,519,731

MILLING CUTTER

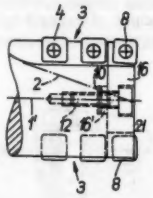
Willi Jester, Herten-Westerholt, and Heinrich Krüger, Essen, both of Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft m.b.H., Essen, Fed. Rep. of Germany

Filed Mar. 15, 1983, Ser. No. 476,341

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211136

Int. Cl.³ B26D *1/00, 1/12;* B23C *5/22*

U.S. Cl. 407—46 1 Claim



1. A frontal face milling cutter comprising:

a supporting body having a longitudinal axis, a longitudinal direction parallel thereto, a frontal face and a circumferential side, said supporting body being provided with a radial recess which extends continuously across a diameter of said frontal face, has a rectangular cross section and is open toward said frontal face, said supporting body further being provided with a bore centered in said supporting body and opening at said frontal face, said bore defining a cylindrical abutment surface in said supporting body;

a plurality of cutting plates disposed on said circumferential side and arranged in rows each extending generally in said longitudinal direction, two of said cutting plates being frontal face cutting plates each having a cutting edge for cutting at both said circumferential side and at said frontal face;

a single frontal face cassette having a cross section corresponding to the rectangular cross section of said recess and being insertable into said recess from the direction of said frontal face, said cassette having a centering ledge for insertion into said bore and for cooperating with said cylindrical abutment surface to secure the position of said cassette in the radial direction of said supporting body, said two frontal face cutting plates having means to fasten said frontal face cutting plates to said cassette and being arranged diametrically opposite one another with respect to the longitudinal axis; and

a fastening element for releasably tightening said cassette in said recess in the direction of said supporting body, said fastening element passing through said cassette and engaging said supporting body from the direction of the frontal face of said supporting body.

4,519,732

METHOD FOR THE MACHINING OF COMPOSITE MATERIALS

John W. Sutcliffe, Tolland, Conn., assignor to United Technologies Corporation, Hartford, Conn.

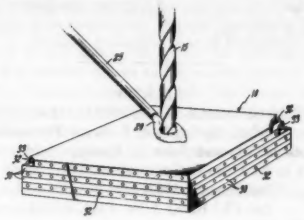
Filed Dec. 9, 1983, Ser. No. 559,996

Int. Cl.³ B23B *51/06, 35/00*

U.S. Cl. 408—1 R 5 Claims

1. In a process of machining a composite by a machine tool, said composite comprising a disposition of fibrous material within a matrix of cured binder material, the improvement characterized by:

lubricating said machine tool with a fluid comprising said binder material in an uncured state for reducing tool wear



and enhancing the rate of removal of said composite material by said tool.

4,519,733

METHOD AND APPARATUS FOR AUTOMATICALLY EXCHANGING A WORKPIECE IN A MACHINE TOOL

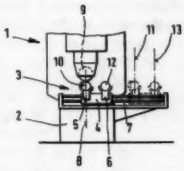
Hans Gregg, Steinebach, Fed. Rep. of Germany, assignor to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,006

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3131016

Int. Cl.³ B23F *19/06, 23/04*

U.S. Cl. 409—7 14 Claims



1. A method for effecting an automatic workpiece exchange on a machine tool, comprising the steps of supporting a carriage for rectilinear feed and return movements between an initial position and a position in a machining region of the machine tool; supporting first and second gripping mechanisms on said carriage which each have gripping members movable relative to one another between gripping and release positions, which are supported for pivotal movement with respect to one another on said carriage at locations spaced in a direction of movement of said carriage, and which are respectively moved from unloading and loading positions to said machining region of the machine tool during said feed movement of said carriage and are returned to said unloading and loading positions during said return movement; supporting cam follower means on said first and second gripping mechanisms; providing cam means along the path of movement of said gripping mechanisms; moving said carriage from said initial position to said machining region, said cam means cooperating with said cam followers on said first and second gripping mechanisms for causing the initially empty first gripping mechanism, during said feed movement of said carriage, to move to its gripping position as it moves through said machining region so as to grip and remove a machined workpiece from a workpiece support mechanism in said machining region of the machine tool and for causing said second gripping mechanism, which is initially loaded with a blank workpiece, to grip the blank workpiece during said feed movement of said carriage and to transport it from said loading position to said machining region of the machine tool, and to thereafter be moved to its release position and to deliver the blank workpiece to said workpiece support mechanism; and thereafter moving said carriage from said

machining region back to said initial position, said cam means cooperating with said cam followers on said first gripping mechanism for causing said first gripping mechanism to be pivoted relative to said second gripping mechanism and to pass under said workpiece support mechanism as it transports the machined workpiece to said unloading position.

4,519,734

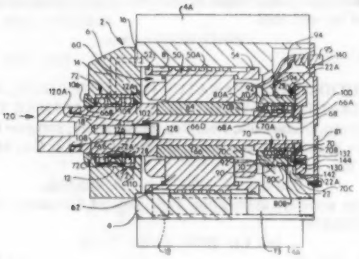
HIGH SPEED SPINDLE WITH PRELOADED BEARINGS

William A. Mitchell, Springfield; J. Brent Thompson, Shrewsbury, both of Vt., and John L. Freese, Charlestown, N.H., assignors to Ex-Cello-O Corporation, Troy, Mich.

Filed Jun. 22, 1982, Ser. No. 391,052

Int. Cl.³ B23Q *5/04;* **F16C** *13/00*

U.S. Cl. 409—231 **19 Claims**



1. In a spindle of the type having a housing and a tool-driving shaft rotatably disposed in the housing by journaling in anti-friction bearing means, the combination of means for axially preloading the bearing means, and bearing preload locking means for locking the preload against axial pull-out forces acting counter to the preload during machining, said preload locking means comprising hydraulic cylinder means associated with the housing, piston means in working hydraulic relation to said cylinder means and coupled to said preloaded bearing means such that axial pull-out forces on the shaft are transmitted to said piston means, first fluid pressure reservoir means in fluid communication with said cylinder means for supplying fluid thereto and means for preventing escape of fluid from said cylinder means to said first reservoir means during machining from expected axial pull-out forces on the shaft to thereby hydraulically lock the bearing preload against substantial diminution by expected axial pull-out forces exerted on the shaft and lock the shaft position and second reservoir means in fluid communication with said cylinder means and having biasing means opposing increases in fluid pressure in said cylinder means from expected axial pull-out forces to prevent fluid escape therefrom from said expected pull-out forces and operable in response to a fluid pressure increase in said cylinder means above a pre-selected level because of unexpectedly high axial pull-out forces during machining for permitting fluid escape from said cylinder means to said second reservoir means to release hydraulic lock on said bearing preload.

4,519,735

EXPANSION ANCHOR

Roland Mächtle, Grunertshofen, Fed. Rep. of Germany, assignor to Werkzeugfabrik Fritz Machtes GmbH & Co. K.G., Munich, Fed. Rep. of Germany

Filed Sep. 29, 1981, Ser. No. 306,717

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137226

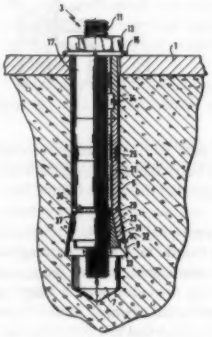
Int. Cl.³ E21D *20/00, 21/00*

U.S. Cl. 411—65 **11 Claims**

1. In an expansion anchor for retention in an approximately cylindrical well hole that is in a body and is provided at a distance from the well hole opening with a conical enlargement flaring toward the bottom of the well hole, sleeve means including a plurality of longitudinally separated shells defining at least two circumferentially spaced latches for insertion into said well hole, a threaded bolt that extends through said sleeve means and has an outer end portion projecting from the well hole opening, a cone screwed onto said bolt and retractable to deflect said latches into engagement with the conical enlargement by movement of the threaded bolt, and radially enlarged clamping means on the outer end portion of the threaded bolt, the improvement comprising, in combination:

a radially extending abutment surface on said cone facing toward the opening of the well hole;

radially extending abutment face means on said sleeve means



in facing relationship to said surface and projecting into the path of retraction of said cone to positively limit movement of the cone toward the well hole opening;

and an internal annular groove in said sleeve means, said groove reducing the wall thickness of said sleeve means an amount such that the sleeve means is capable of being deformed outwardly in the region of said groove to shorten the sleeve means by continued movement of the threaded bolt after the latches have initially engaged within said well hole and the abutment surface means is against the abutment face means, whereby the sleeve means is deformed without clamping onto the threaded bolt and the radially enlarged clamping means may clamp an element against said body.

4,519,736

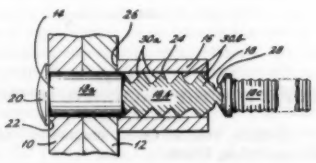
PIN TYPE FASTENER USABLE WITH SWAGE COLLAR TO FORM A JOINT

Jerry A. Sigmund, 19 Rock Hill Rd., Bala Cynwyd, Pa. 19004

Filed May 7, 1982, Ser. No. 376,226

Int. Cl.³ F16B *19/05, 39/30*

U.S. Cl. 411—361 **17 Claims**



1. A pin member adapted to be used with a collar for fastening a joint, said pin member comprising a head and a shank extending therefrom, said shank including a locking portion formed with a plurality of ribs separated from each other by locking grooves, the major diameter of said ribs being substan-

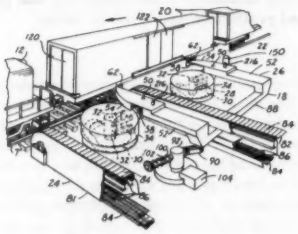
tially equal, at least one of said ribs being formed with a portion symmetrical about a line extending at a right angle to the axis of said shank and a portion asymmetrical about said line, said one rib including a load bearing flank and a non-load bearing flank, said flanks being joined by a radiused crest through which said line extends.

4,519,737

ROTARY LOADER AND SIDE-COUPLING TRANSFER SYSTEM

Leonard D. Barry, 19300 Pennington, Detroit, Mich. 48221

Filed Feb. 7, 1983, Ser. No. 464,567
Int. Cl.³ B61K *1/00;* **B65G** *67/22*
U.S. Cl. 414—337 **10 Claims**



1. In a rotary loading system having a vehicle way, at least one vehicle thereon having a berth for carrying a container, a rotary loader having a fork frame, two substantially parallel rotary arms, two pivot posts vertically positioned equal distance from said way to which said arms are mounted to rotate horizontally, said fork frame being pivotally mounted on each said arm an equal distance out to carry said fork frame over an arc over said way, and means for lifting and lowering said fork frame when extended over said way for transfer of the container, said fork frame having a fork arm at each end for engaging under the container and coupling with the vehicle: each said fork arm having a depending vertical wall or track running diagonally of the fork arm sloped toward the other said fork arm to the end of the fork arm facing said way, a side coupler on said vehicle for engaging said fork frame for transfer of said container, said coupler including an arm pivotally mounted to said vehicle and extending out side ways from the vehicle and having an upstanding hook for engaging behind said wall for engaging and pulling said fork into an opening in said car for aligning under said berth for transfer of said container, said wall ending with an opening for said hook to come out from behind the wall where said fork frame is engaged enough to move with said vehicle for transfer, and pivot means for supporting said hook to follow said wall and come out from under said fork arm, and load actuated means for raising and lowering said hook to correspond with the height of said fork arm.

4,519,738

BOAT TRAILER

David C. Wood, Rte. 9, Box 830, Franklinton, La. 70438

Filed Mar. 28, 1983, Ser. No. 479,553
Int. Cl.³ B60P *3/10*
U.S. Cl. 414—483 **11 Claims**

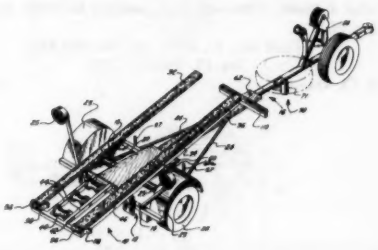
1. A boat trailer adapted for launching and retriving a boat without wetting the axle and bearings of the trailer, comprising:

a. frame means for supporting the boat;

b. tongue means rigidly connected to said frame means for connecting said frame means to a vehicle towing said trailer, said tongue means having a first bracket means connected thereto for storing a spare tire, said first bracket means having a vertical, cylindrical socket for receipt of an axle assembly connected to the spare tire, the axle assembly including an axle perpendicularly connected to a flange rigidly connectable to said spare tire, second bracket means connected to the front portion of said tongue, said second bracket means having a horizontal, cylindrical socket for receipt of said axle assembly connected to said spare tire, means for holding said axle in said first bracket means and in second bracket means, said vertical socket connected to said first bracket means being slightly longer than said axle connected to said flange and said horizontal socket connected to said second bracket means being slightly shorter than said axle connected to said flange;

c. an axle connected to said frame means by springs, said axle having wheels thereon;

d. ramp means pivotally connected to said frame means at the rear of said frame means for receiving said boat, said



rear of said frame means being located rearward of said axle, said ramp means being pivotally mounted on an axis perpendicular to the longitudinal axis of said tongue means, said ramp means being mounted independently of the wheels supporting said frame means and having the major portion of its length extending forwardly of said axis, said ramp means having a plurality of roller means mounted for aiding in loading a boat in the rear end thereof past said axis, said roller means being positioned in the center of said ramp means in alignment with said tongue of said trailer, said ramp means having two boat support means extending parallel to each other and perpendicular to said axis of said ramp means for contacting and supporting said boat, and

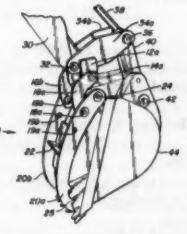
e. means connected to said ramp means and to said frame means for limiting the height to which the front portion of said ramp means may rise.

4,519,739

BACKHOE CLAMPING DEVICE

Joel V. Risch, 3275 Lucia Ave., Eureka, Calif. 95501

Filed May 25, 1984, Ser. No. 614,183
Int. Cl.³ B66F *9/18;* **E07F** *3/32*
U.S. Cl. 414—724 **11 Claims**



1. Apparatus for attachment to a backhoe for conversion

thereof to a clamping device, said backhoe having a bucket, a dipper arm and a bucket link, connected by a first pivot point between said bucket and said bucket link, a second pivot point between said bucket link and said dipper arm, and a third pivot point between said bucket and said dipper arm, said apparatus comprising:

at least one mounting bracket on said bucket link;

a clamp link pivotally mounted at one end thereof to said at least one mounting bracket at a fourth pivot point closer to said second pivot point than to said first pivot point; and

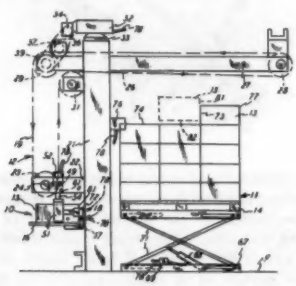
a clamp arm pivotally mounted to a second end of each said clamp link at a fifth pivot point, and pivotally mounted to said dipper arm at a sixth pivot point.

4,519,740

APPARATUS AND METHOD FOR PALLETIZING BUNDLES OF SHEETS

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Jun. 17, 1983, Ser. No. 505,455
Int. Cl.³ B65G *57/03*
U.S. Cl. 414—71 **13 Claims**



1. Apparatus for palletizing bundles of sheets, comprising a pallet, a gripper for engaging a bundle of sheets, an overhead endless conveyor on which said gripper is mounted and including a vertical section for elevating said bundle of sheets from a first position and including a horizontal section for moving said bundle of sheets to a second position vertically above said pallet, said conveyor sections being continuous relative to each other for movement between said first position and said second position, an electric drive operatively connected with said overhead endless conveyor for powering said overhead endless conveyor, electric elements at said first position and at said second position and being electrically interconnected with said electric drive for controlling the operation of said electric drive in the movement of said bundle of sheets, said gripper includes a powered elevator for lowering said bundle of sheets at said second position and independent of the movement by said endless conveyor, and an additional electric element operatively connected with said elevator for powering said elevator at said first position to raise said bundle of sheets prior to the raising by said conveyor.

4,519,741

MOBILE YARD CRANE FOR HANDLING CONTAINERS

Guido Testore, Ovada, Italy, assignor to ORMIG S.p.A., Ovada, Italy

Filed Jan. 4, 1982, Ser. No. 336,586
Int. Cl.³ B66C *1/10*
U.S. Cl. 414—738 **3 Claims**

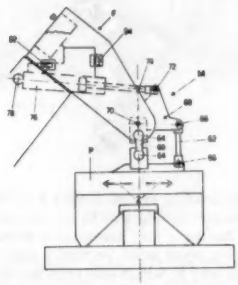
1. A mobile yard crane for handling large containers and the like, said crane comprising:

a mobile chassis;

at least two lifting jibs having respective first ends mounted on said chassis such that said jibs are movable with respect thereto in vertical planes which are parallel and fixed with respect to each other and respective second ends having fixed thereto respective jib heads;

spreader means supported by said jib heads of said jibs for engaging a container to be handled, said spreader means having a planar configuration;

separated attaching means for each said jib head for suspending said spreader means from said jib heads such that said spreader means is oscillatable with respect to said jib heads generally in a plane parallel to said vertical planes, each said attaching means comprising rigid and nonextendable articulated members including a plate pivotally connected to the respective said jib head, a first rod having opposite ends thereof swivelly connected to said respective jib head and to a first position on said spreader means, and a second rod having opposite ends thereof pivotally connected to the respective said plate and to a second position on said spreader means;



separate damping means for each said attaching means and the respective said jib head for damping oscillation of said spreader means;

separate hydraulic cylinder means connected to said chassis and to respective said jibs for moving said jibs independently in said respective vertical planes; and

hydraulic control circuit means, connected to said separate hydraulic cylinder means, selectively for operating said separate hydraulic cylinder means in unison, thereby synchronously moving said jibs in said respective vertical planes, or for operating a selected one only of said separate hydraulic cylinder means, thereby moving only the respective said jib in the respective said vertical plane, and thereby inclinind the plane of said spreader means, whereby said spreader means may be positioned to engage an inclined container.

4,519,742

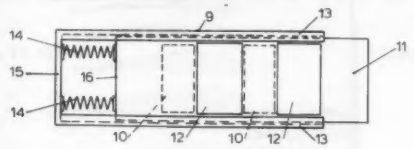
APPARATUS FOR UTILIZING THE ENERGY PRESENT IN FLOWING WATER

Arend Van Buytene, Burmanlaan 66, 2241 JH Wassenaar, Netherlands

PCT No. PCT/NL82/00010, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982, PCT Pub. No. WO82/03425, PCT Pub. Date Oct. 14, 1982
PCT Filed Apr. 2, 1982, Ser. No. 451,148
Claims priority, application Netherlands, Apr. 2, 1981, 8101659
Int. Cl.³ F03B *7/00*
U.S. Cl. 415—7 **5 Claims**

1. Apparatus for converting the energy in flowing water comprising a support adapted to be located in association with the flowing water, at least one paddle wheel comprising a rotatable shaft journaled on said support, a plurality of blades each fixed at one end to said shaft and extending radially outwardly therefrom, each of said blades having at least one

opening for the passage of fluid therethrough, and a slide substantially coextensive with said blade and secured thereto for movement between an inner position overlapping said blade and an outer position partially overlapping said blade and partially extending radially therefrom, said slide having at least one opening, said openings being arranged to be in registry with the openings in said blade in the inner position allowing passages of water and out of registry with the openings in said blade in the other position whereby said openings in said



blade are occluded preventing passage of water, spring means interposed between the inner ends of said blade and slide for normally biasing the slide in the outer position, and an arcuate cam ring fixed to said support and circumferentially surrounding said blades, said arcuate member having an inner surface at least in part slidably engaged by the outer end of said slide causing said slide to move reciprocally against said spring means between said inner and outer positions during rotation of said blades.

4,519,743

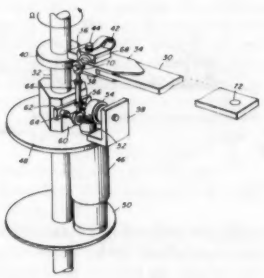
HELICOPTER INDIVIDUAL BLADE CONTROL SYSTEM

Norman D. Ham, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 132,705, Mar. 21, 1980, abandoned. This application Jul. 2, 1982, Ser. No. 394,832

Int. Cl.³ B64C *27/44, 27/70*

U.S. Cl. 416—1 **26 Claims**



1. An aircraft rotor assembly including lift control means for control of lift of aircraft blades, movement sensor means associated with each aircraft blade, and electrical feedback circuitry for controlling the lift control means in response to signals generated by the movement sensor means, that rotor assembly characterized by:

the sensor means associated with each rotor blade comprising at least one accelerometer oriented relative to a direction of blade movement, caused by characteristic disturbances of blade motion, to sense that blade movement.

4,519,744

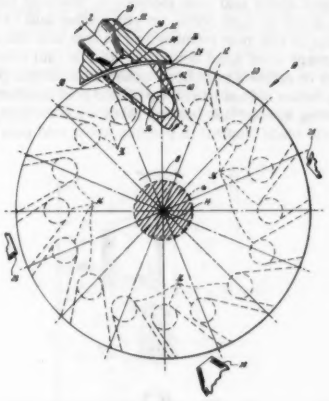
TURBINE POWER PLANT

Frank G. Arold, 145 Hillcrest Blvd., Ypsilanti, Mich. 48197

Filed May 25, 1984, Ser. No. 614,422

Int. Cl.³ F01D *5/04*

U.S. Cl. 415—92 **20 Claims**



20. A power plant comprising a rotor journaled about an axis of rotation via a shaft through which useful power is delivered, a stator disposed adjacent a peripheral portion of said rotor, and means for operating said rotor comprising fluid delivery means on said stator for directing working fluid toward said peripheral portion of said rotor and chambers disposed at intervals around said peripheral portion of said rotor, each chamber having an intake opening through which working fluid from said fluid delivery means passes to impinge on a reaction surface, and an exhaust opening through which fluid passes from said rotor after impinging upon said reaction surface, and reaction surfaces on said stator against which working fluid exiting said exhaust opening impinges, said stator reaction surfaces being arranged relative to the rotor chambers' reaction surfaces such that fluid exiting said exhaust openings and impinging on said stator reaction surfaces augments the rotation of said rotor which is produced by the impingement of the fluid from said fluid delivery means on the rotor chambers' reaction surfaces.

4,519,745

ROTOR BLADE AND STATOR VANE USING CERAMIC SHELL

Irwin E. Rosman, Woodland Hills, Calif., and Hector S. Bourgeois, Monument Beach, Mass., assignors to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 188,646, Sep. 19, 1980, abandoned. This application Jul. 12, 1982, Ser. No. 397,267

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—96 A **17 Claims**

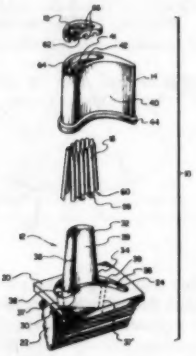
1. A ceramic blade assembly suitable for attachment to a turbine rotor hub comprising a disk having a plurality of shaped slots along the periphery of said disk for receiving individual turbine blades, said ceramic blade assembly comprising:

a base element comprising means for affixing said base element to said turbine rotor hub at said slots, a platform portion affixed to said engagement means, said platform portion having rim means for defining a recess in said platform for receiving the footing of a blade element, said defined recess having a floor, and a post member affixed to and extending from said floor of said platform portion,

said post member having a post-root, a tip and exterior surfaces;

a ceramic blade element comprising an airfoil shaped body having interior surfaces for defining an internal span-wise channel for receiving said post member and rim means for defining a footing for engagement with said rim means of said base element, said ceramic blade element being positioned about said post member so that said interior surfaces are at least partly set apart from said exterior surfaces of said post member and so that said ceramic blade element is set apart from said floor of said platform portion to define a peripheral channel about said post-root;

a cap means affixed to said tip of said post member, said cap having at least one bearing surface for retaining said ceramic blade element in position about said post member;



at least one resilient corrugated partition positioned between and in contact with said interior and exterior surfaces, said resilient corrugated partition defining contiguous sets of juxtaposed passages situated between said ceramic blade element and said post member, said sets of passages being in communication with said peripheral channel and said sets including a first set of passages open to said exterior surfaces of said post member and a second set of passages open to said interior surfaces of said ceramic blade element;

means for supplying cooling fluid to said first set of passages through said peripheral channel;

means for exiting said cooling fluid from said first set of passages at said tip; and

means for forming columns of stagnated fluid within said second set of passages to insulate said ceramic blade element.

4,519,746

AIRFOIL BLADE

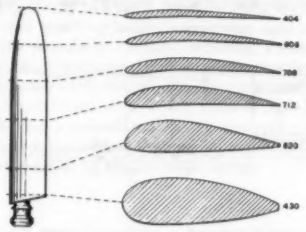
Harry S. Wainauski, Simsbury, and Carl Rohrbach, Manchester, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Jul. 24, 1981, Ser. No. 286,484

Int. Cl.³ B64C *11/18*

U.S. Cl. 416—223 R **3 Claims**

1. An airfoil blade having along substantially the entire length thereof, a cross-sectional airfoil shape comprising a rounded, generally parabolic leading edge portion fairing into a pressure surface; said pressure surface having a leading convex portion fairing into a trailing portion; said leading edge portion also fairing into a convex suction surface; said pressure and suction surfaces merging into a blunt trailing edge; one of said airfoil shapes having a thickness ratio of 0.04, a maximum thickness at approximately 0.35 x/c and a maximum camber at approximately 0.5 x/c; another of said airfoil shapes having a thickness ratio of 0.06, a maximum thickness at approximately 0.34 x/c and a maximum camber at approximately 0.50 x/c; another of said airfoil shapes having a thickness ratio of 0.08, a maximum thickness at approximately 0.33 x/c and a maximum camber at approximately 0.50 x/c; another of said airfoil shapes having a thickness ratio of 0.12, a maximum thickness at approximately 0.32 x/c and a maximum camber at approximately 0.38 x/c; another of said airfoil shapes having a thickness ratio of 0.20, a maximum thickness at approximately 0.315 x/c and a



maximum camber at approximately 0.30 x/c and another of said airfoil shapes having a thickness ratio of 0.30, a maximum thickness at approximately 0.310 x/c and a maximum camber at approximately 0.29 x/c wherein x/c is the dimensionless chord length of said airfoil shapes; all of said airfoil shapes having a trailing edge portion of a thickness equal to approximately 10% of the maximum shape thickness.

4,519,747

METHOD FOR ASSEMBLING AN IMPELLER ONTO A TURBOSHAFT

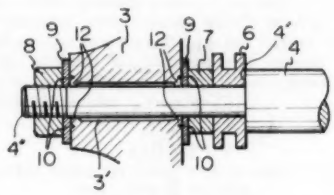
Masami Yamazaki, and Sueo Shibata, both of Okazaki, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 5, 1982, Ser. No. 375,213

Claims priority, application Japan, Jan. 20, 1982, 57-6119

Int. Cl.³ F04D *29/22*; F16B *4/00*

U.S. Cl. 416—244 A **6 Claims**



1. A turbocharger comprising a turbine, a turboshaft integrated with said turbine and having a free end extending from one side of the turbine, the free end including a straight cylindrical portion, and an impeller having opposite end faces and an axial hole therethrough, the impeller fitting in spaced relation to the one side of the turbine on the straight cylindrical portion of the free end of the turboshaft via said axial hole, wherein each end face of the impeller is plastically deformed axially inwardly in a circular pattern around said axial hole so as to create a circumferentially uniform, radially inward plastic deformation of the material of the impeller sufficient to eliminate any clearance between the inner surface of the axial hole adjacent to the end faces of the impeller and the outer surface of said straight cylindrical portion of the turboshaft.

4,519,748

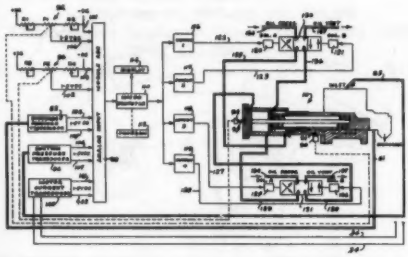
MICRO-PROCESSOR CONTROL OF COMPRESSION RATIO AT FULL LOAD IN A HELICAL SCREW ROTARY COMPRESSOR RESPONSIVE TO COMPRESSOR DRIVE MOTOR CURRENT

David A. Murphy, Chambersburg, Pa., and Peter C. Spellar, Hagerstown, Md., assignors to Frick Company, Waynesboro, Pa.

Continuation of Ser. No. 453,988, Dec. 28, 1982, abandoned, which is a continuation-in-part of Ser. No. 416,768, Sep. 10, 1982, abandoned. This application Oct. 10, 1984, Ser. No. 659,039

Int. Cl.[3] F04B *49/06;* F01C *1/16*

U.S. Cl. 417—45 8 Claims



1. In an electric motor driven screw compressor having meshing helical rotors on parallel axes and mounted in a housing having intersecting cylindrical bores, a high pressure end wall at one end of said housing and a low pressure end wall at the other end thereof, the low pressure end wall having an inlet opening and the high pressure end wall having a discharge opening, an axially extending recess in the housing in open communication with said bores, a slide member mounted for axial movement in the recess, said slide member having interfacial sealing relationship with said rotors, said slide member having a discharge face at one end thereof which is adjacent to the high pressure end wall whereby movement of the slide member is operative to change the compression ratio, the improvement comprising, means sensing the magnitude of current to said electric motor, means for sensing when the compressor is operating at full load, means for incrementally moving the slide member in each direction, and means responsive to full load operation for causing the slide member to move in one direction while the motor current is decreasing, to change to the other direction upon an increase in the motor current, to continue to move in said other direction while the motor current is decreasing, and to change back to said one direction upon an increase in the motor current.

4,519,749

WIND-SOLAR LIFT PUMP

Iosif Baumberg, Brooklyn, N.Y., assignor to B & H Technologies, Inc., New York, N.Y.

Filed Nov. 15, 1982, Ser. No. 441,740

Int. Cl.[3] F04F *9/00*

U.S. Cl. 417—158 8 Claims

1. A device for the raising of liquid by the use of solar and/or wind energy comprising:

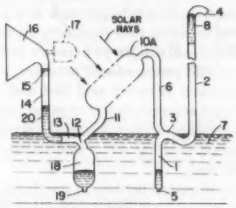
a first section of pipe to be immersed in the liquid, the section of pipe extending downwardly from the surface of the liquid upon immersion therein;

a second section of pipe to be directed upwardly from the surface of the liquid; and

a third section of pipe joining the top of said first section and the bottom of said second section of pipe, the interconnection of said third section with said first section of pipe being located higher than the interconnection of said third section with said second section of pipe to provide for entrapment of liquid within said third section upon immersion of said first section of pipe into the liquid up to said first-mentioned interconnection; and wherein

said first section includes a liquid inlet at a bottom end thereof and an air port at the top end thereof, there being a liquid discharge port at the the top end of said second section of pipe; said device further including

pressure means for appying a pressure differential between said air port and said discharge port, said pressure differential means being responsive to the presence of liquid in said third section of pipe such that pressure from said pressure differential means builds up when said third section is closed off with liquid and decreases upon the



voiding of said third section and said second section of liquid; and wherein

said air port forms a tee with said interconnection of said third section with said first section of pipe to set said pressure means away from a path of liquid flow between said first and said third sections of pipe, thereby to form a bead of liquid in said third section in response to said pressure differential, and to provide an air passage to said pressure means via said air port upon discharge of said bead of liquid at said discharge port, said pressure differential and said air passage being formed alternately and repetitively during the presence of solar and/or wind energy.

4,519,750

VARIABLE-DELIVERY REFRIGERANT COMPRESSOR

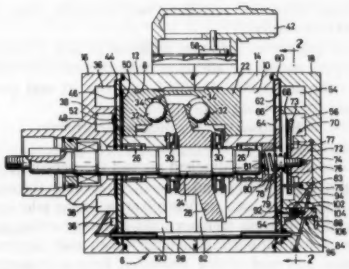
Masayuki Kurahashi, Nagoya; Hisao Kobayashi, and Hiroyuki Deguchi, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Nov. 29, 1983, Ser. No. 556,163

Claims priority, application Japan, Dec. 20, 1982, 57-224573

Int. Cl.[3] F04B *1/26, 49/02*

U.S. Cl. 417—270 16 Claims



1. A variable-delivery refrigerant compressor, comprising:

a plurality of compression chambers in which a refrigerant gas is compressed for delivery thereof from the compressor;

discharge valves disposed corresponding to said compression chambers;

an actuator including a piston movable between a first position thereof at which all of said discharge valves are rendered operative to perform their normal valving function, and a second position thereof at which at least one of said discharge valve is rendered inoperative;

means for defining a first passage through which a discharge pressure of the compressor is applied to said piston of said actuator;

means for defining a second passage through which a suction-side pressure of the refrigerant gas on the suction side of the compressor is applied to said piston of said actuator;

a pilot switch valve disposed in association with said first and second passages, and including a valve spool which receives said suction-side pressure as a pilot pressure and is movable between two positions, to control a mode of application of said discharge pressure and said suction-side pressure to said piston of said actuator, and thereby operate said actuator between said first and second positions, such that said actuator is placed in said first position while a suction pressure of the compressor is relatively high, and in said second position while said suction pressure is relatively low; and

a check valve disposed between a discharge chamber associated with said at least one discharge valve and an outlet port of the compressor from which the compressed refrigerant gas is delivered, said check valve blocking a flow of said refrigerant gas in a direction from said outlet port toward said discharge chamber.

4,519,751

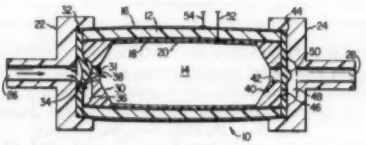
PIEZOELECTRIC PUMP WITH INTERNAL LOAD SENSOR

John B. Beckman, Cedartown, and Martin J. Blickstein, Austell, both of Ga., assignors to The Abet Group, Rome, Ga.

Filed Dec. 16, 1982, Ser. No. 450,338

Int. Cl.³ F04B *17/00*

U.S. Cl. 417—322 **3 Claims**



1. A pump comprising:

piezoelectric pumping means for providing an expanding and contracting volume;

activating means for activating said pumping means to expand and contract;

first valving means disposed adjacent to said piezoelectric pumping means for allowing only afferent flow and second valving means disposed adjacent to said pumping means for allowing only efferent flow;

said first and second valving means comprising:

a supporting member having an inlet opening;

a resilient diaphragm attached around the periphery to said supporting member and having an orifice through the surface thereof, said orifice offset from the inlet opening of said supporting member, said orifice abutting the surface of said supporting member when said diaphragm is relaxed and said orifice distended from said supporting member when pressurized on the side of said diaphragm adjacent said supporting member, said resilient diaphragm also comprising a decreased area of elasticity on the surface of said diaphragm locally disposed adjacent said inlet opening in the relaxed state of said diaphragm; and

sensing means for piezoelectrically sensing the piezoelectric effect resulting from the internal load on said pumping means.

4,519,752

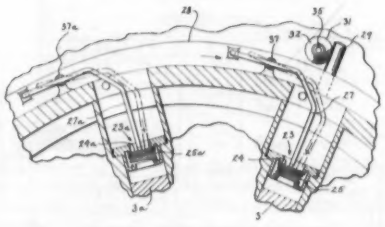
CONTROL SYSTEM FOR A VARIABLE DISPLACEMENT PUMP

Ingo Valentin, Brookfield, Wis., assignor to Applied Power Inc., Brookfield, Wis.

Division of Ser. No. 414,639, Sep. 3, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 625,571

Int. Cl.³ F04B *49/02, 49/08*

U.S. Cl. 417—298 **3 Claims**



1. A hydraulic system, comprising a variable displacement hydraulic pump having a cylinder communicating with an inlet fluid supply line and an outlet fluid discharge line, a reciprocating main piston element disposed in said cylinder having a suction stroke wherein fluid enters the cylinder from the inlet line and a power stroke for pumping fluid from the cylinder into the discharge line; inlet check valve means for controlling the flow of fluid from the inlet line to the cylinder, said inlet check valve means includes a movable valve stop member biased toward a seated position to prevent the flow of fluid from the cylinder to the inlet line during said power stroke and movable from its seated position to an open position to permit the flow of fluid from the inlet line to the cylinder during said suction stroke; outlet check valve means for controlling the flow of fluid from the cylinder to the discharge line; and control means for varying the volume of fluid discharged, said control means includes a resilient actuator member movable in response to a preselected system variable between a first unflexed position wherein it permits the inlet check valve stop member to seat so that the main piston element develops working pressure in the cylinder, and a second flexed position wherein it applies a force against the inlet check valve stop member, said force being sufficient to hold the inlet valve stop member off its seat in its open position after said stop member is opened during the piston suction stroke to prevent the development of working pressure in the cylinder during the piston power stroke, said actuator member is mounted on a movable support means, and further including means for moving said support means whereby said actuator member is moved between its first and second positions, said moving means includes a pilot-operated plunger engageable with said support means and shiftable between a first position wherein said actuator member is in its first position, and a second position wherein said actuator member is in its second position; means for biasing the plunger toward its first position; and a pilot line between the pump discharge line and the plunger for applying discharge line pressure to the plunger opposite the biasing means to shift the plunger into its second position when the force exerted by the pilot line pressure exceeds the force exerted by the biasing means, and said pump is a radial piston pump having a plurality of radially disposed reciprocating piston elements and a plurality of inlet check valve means controlling the flow of fluid to each piston cylinder, and said support means includes a rotatable ring having a plurality of circumferentially spaced apart resilient members mounted

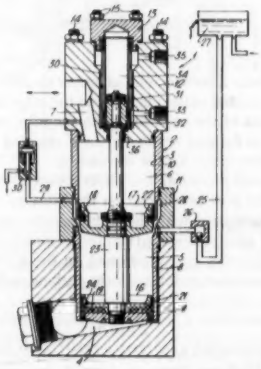
thereto for controlling the position of each of said inlet check valves.

4,519,753

DISPLACEMENT PUMP SUITABLE FOR PUMPING SUSPENSIONS

Henrik M. Kitsnik, Segmon, Sweden, assignor to HK-Engineering Aktiebolag, Segmon, Sweden

Filed Sep. 14, 1982, Ser. No. 418,185
Claims priority, application Sweden, Oct. 9, 1981, 8105988
Int. Cl.³ F04B *15/02*
U.S. Cl. 417—403 **9 Claims**



1. A hydraulically driven pump of the displacement type suitable for pumping a pumping medium at high pumping pressures, said pump comprising:

(a) a pump housing;

(b) a pump chamber provided in said pump housing having an inlet conduit and an outlet conduit with associated respective inlet and outlet valves;

(c) a pump piston arranged in a pump cylinder in said pump chamber, said pump cylinder having a pump cylinder wall, said pump piston and said pump cylinder wall defining a comparatively large gap therebetween;

(d) an oil section arranged above said pump chamber;

(e) a working piston arranged in an oil section cylinder in said oil section, said oil section cylinder having an oil section cylinder wall, said working piston being connected to said pump piston through at least one mechanical connecting member;

(f) a first sealing means mounted on said working piston for sealing said working piston against said oil section cylinder wall;

(g) a second sealing means mounted on said pump piston for preventing flow of pumping medium into contact with said first sealing means on said working piston during a suction stroke of said pump;

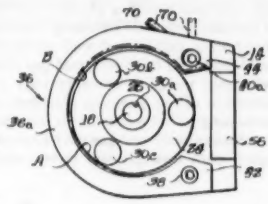
(h) a clean water section arranged between said oil section and said pump chamber, said clean water section extending between said working piston and said pump piston so that the same water pressure (Pv), which is approximately of the same magnitude as pressures in said section and in said pump chamber, is exerted on a front side of said working piston as on a rear side of said pump piston.

4,519,754

PERISTALTIC PUMP HAVING VARIABLE OCCLUSION RATES

Dale E. Minick, Rte. 2, Box 337, Rapid City, Mich. 49676

Continuation of Ser. No. 306,667, Sep. 29, 1981, abandoned. This application Nov. 17, 1983, Ser. No. 552,760
Int. Cl.³ F04B *43/12*
U.S. Cl. 417—477 **5 Claims**



1. A peristaltic pump having a fixed variable occlusion path and adapted to selectively vary the occlusion rate to cause dissipation of heat due to tube deformation stresses comprising:

a housing;

a rotor mounted on said housing and adapted for rotation about its longitudinal axis, at least three compression rollers carried by said rotor for movement in a circular path during rotation of said rotor, a reaction member mounted on said housing and having a reaction surface of substantial uniform radius adapted to partially encircle about 270° of the circular path traveled by said at least three compression rollers, a compressible flow tube interposed between said rotor and said reaction surface and adapted to be occluded by said compression rollers during movement through said circular path, said tube having an inlet end and having an outlet end from which the fluid flows;

pivot means for pivotally mounting one terminal end of the reaction member to the housing at a fixed pivot axis for pivotal movement about the fixed axis adjacent the inlet end of the flow tube;

cam means connected to opposite reaction member terminal end and being adjustable to move the reaction surface of the reaction member about the pivot means toward the compression rollers to cause a progressively increasing occlusion of the tube from the beginning of the reaction surface in a first zone of approximately 90° to a fixed point of maximum occlusion, a second zone of decreasing occlusion extending from the fixed point of maximum occlusion through a central portion of the reaction member, and a third zone decreasing to substantially zero occlusion extending to the outlet end of the reaction member;

said cam means and said pivot means being releasably mounted on said housing to permit axial removal of the reaction member relative to the rotor to permit tube replacement.

4,519,755

GEROTOR VACUUM PUMP

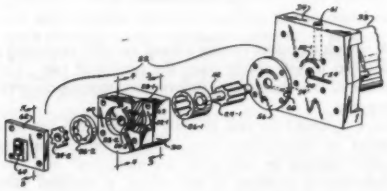
David E. Hanson, Hoffman Estates, Ill., assignor to Sargent-Welch Scientific Company, Skokie, Ill.

Continuation of Ser. No. 470,084, Mar. 3, 1983, abandoned, which is a continuation of Ser. No. 148,453, May 9, 1980, abandoned. This application Jan. 23, 1984, Ser. No. 572,140
Int. Cl.³ F04C *18/10, 25/02, 27/02*
U.S. Cl. 418—9 **18 Claims**

1. In a gerotor vacuum pump adapted for evacuating gases from a container or the like at relatively low pressure levels, wherein the gases are drawn from the container into said pump through a vacuum connection and into a pumping chamber, said pump including first and second walls defining a rotor chamber therebetween, an outer rotor having a plurality of

teeth disposed on the inner axial surface thereof, an inner rotor mounted on a shaft for rotation within said outer rotor and having one less tooth on its outer axial surface than said outer rotor, the inner axial surface of said outer rotor and the outer axial surface of said inner rotor defining at least one pumping chamber which expands and contracts as said inner rotor rotates relative to said outer rotor, the improvement comprising:

a gas inlet port in said first wall disposed between said vacuum connection and said pumping chamber, said gas inlet port communicating with said pumping chamber during a substantial portion of the time when said pumping chamber is expanding, a gas outlet port in said second wall axially disposed and angularly spaced from said inlet port, said gas inlet port communicating with said pumping chamber only just prior to complete contraction of the pumping chamber, and oil inlet means communicating an oil source with said gas inlet port, said oil communicating with said gas inlet port and following a generally spiral path through said pump, said oil source



having a pressure greater than the pressure within said gas inlet port and said pumping chamber during operation of said pump, whereby the expansion of said pumping chamber during operation of said pump creates a pressure differential between said oil source and said gas inlet port which draws oil from said oil inlet means through said gas inlet port with said gas being evacuated from said container into said pumping chamber and coating the contacting surfaces of said inner rotor and outer rotor upon communication of said gas inlet port with said pumping chamber to provide an oil coating between said contacting surfaces so as to seal the gas in said pumping chamber during the expansion and contraction of said pumping chamber and permit the pumping of relatively low pressure levels, the inner rotor minor root diameter being sufficiently larger than the diameter of said shaft to provide a relatively wide uninterrupted area which receives an oil film during operation of the pump which thereby effectively minimizes bypass of gas between an endface of said inner rotor and a surface of the first wall adjacent thereto.

4,519,756

CONSTANT DISPLACEMENT TURBINE WITH VANE WHICH PIVOTS AND ROTATES

John W. Fenton, 26 Shoreland Dr. - Angler's Park Shores, Key Largo, Fla. 33037

Filed Sep. 30, 1983, Ser. No. 537,934
Int. Cl.[3] F01C *3/06*
U.S. Cl. 418—68 **21 Claims**

1. A turbine, comprising:

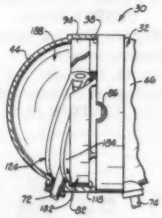
a housing including at least one lobe having a lobe inner surface symmetrically disposed about a lobe axis and conforming to a portion of a spherical surface centered on a lobe center disposed on the lobe axis, wherein a drive shaft aperture intersecting the lobe inner surface is formed through the housing along a drive shaft axis extending radially from the lobe center at an angle to the lobe axis;

a vane having a vane pivotation axis extending therethrough, wherein a sealing surface is formed on the vane to mate with the lobe inner surface, the sealing surface extending arcuately about the center of the vane pivotation axis between opposite ends of the vane pivotation axis;

means for mounting the vane within the housing for simultaneous pivotation of the vane about the vane pivotation axis and rotation of the vane about the lobe axis with the vane pivotation axis extending through the lobe center perpendicularly to the lobe axis;

a drive shaft passing through the drive shaft aperture and pivotally connected to the vane for pivotation relative thereto about an axis passing through the lobe center normally to the vane pivotation axis;

means for blocking fluid communication between opposite sides of the vane separated by the vane sealing surface so



as to form a turbine inlet chamber to one side of the vane and a turbine outlet chamber to the other side of the vane, the sides of the vane to which the inlet and outlet chambers are formed reversing for a selected position of the vane pivotation axis in the casing;

an inlet port providing fluid inlet means to the lobe interior, the inlet port positioned on the housing to provide fluid communication with the turbine inlet chamber; and

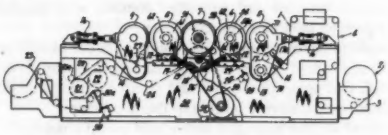
an outlet port providing fluid outlet means to the lobe interior, the inlet port positioned on the housing to provide fluid communication with the turbine outlet chamber.

4,519,757

WEB SURFACE TREATING APPARATUS

Eugene W. Wittkopf, Suamico; Allen R. Jorgensen, Abrams, and Robert A. Daane, Green Bay, all of Wis., assignors to Magna-Graphics Corporation, Oconto Falls, Wis.

Filed Jan. 17, 1984, Ser. No. 571,596
Int. Cl.[3] B29D *7/14;* **B29C** *15/00*
U.S. Cl. 425—143 **23 Claims**



1. In a web treating apparatus for heat treating of the surface of a web drawn from a roll stock, comprising at least three surface treating rolls including a covered roll located between first and second heated rolls, said heated rolls including a rigid round base having end bearing supports for rotatably supporting the roll, said rigid base having a finished outer surface, a plurality of passageways extending axially through the base and located immediately inwardly of the outer surface, means for transferring a temperature controlled liquid through said passageways at an essentially controllable constant temperature for transfer of thermal energy through said outer wall, means for urging said rolls into engagement at a selected working pressure, said passageways and said outer wall and the portions of the roll located between said passageways being arranged and constructed to establish an outer wall strength sufficient to support said working load essentially without deflection of said outer wall into said passageways and simultaneously establishing transfer of thermal energy through said

outer wall to maintain an operative constant temperature over the face of the heated roll with the temperature of the outer wall which is aligned with the passageways being essentially identical to the temperature of the outer wall which is aligned with the portions of the roll separating said passageways.

4,519,758

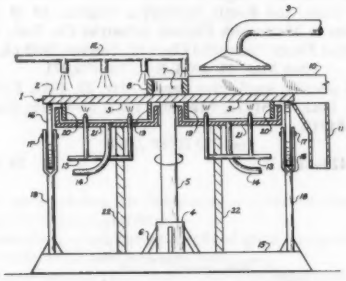
ROTARY COOLING TABLE

Edward J. Skach, Jr., Angleton, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 334,201, Dec. 24, 1981, abandoned. This application Jul. 29, 1983, Ser. No. 518,773

Int. Cl.³ B01J *2/14*

U.S. Cl. 425—6 **10 Claims**



1. An apparatus consisting essentially of a flat, horizontal, planar, circular, rotatably mounted sheet or plate on a support means in operable combination with a fixated rotation means, a means for supplying an inert gas coolant to the upper surface of the sheet or plate, a means for cooling the underside surface of the said sheet or plate, a means for feeding a molten material to a non-central portion of the surface of the sheet or plate as it is rotated, and a means for scraping said material, in its cooled condition, from the surface of said sheet or plate at a point distal from said feed means, said rotation means being characterized as one which revolves the plate at a speed slow enough to prevent centrifugal forces from causing flow of the material toward the edge of the plate before it reaches the scraper means.

4,519,759

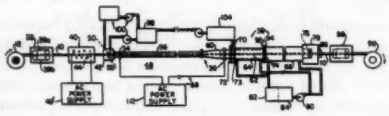
APPARATUS FOR MAKING SHRINKABLE TUBING

Carlos Katz, Edison, N.J., and Amicam C. Zidon, Yorktown, N.Y., assignors to Cable Technology Laboratories, Inc., New Brunswick, N.J.

Division of Ser. No. 410,443, Aug. 23, 1982, Pat. No. 4,446,095. This application Jan. 12, 1984, Ser. No. 570,218

Int. Cl.³ B29C *17/07;* **B29D** *23/03, 23/04*

U.S. Cl. 425—97 **9 Claims**



1. Apparatus for manufacturing long lengths of a heat-shrinkable sleeve for use in splicing electrical cables and the like, comprising

forming means for forming an elongated sleeve having a plurality of layers formed of a thermosettable material around an elongated core;

means for continuously advancing said core and said sleeve in a generally axial direction;

heating pipe means cooperating with said core and sleeve for surrounding, heating, and curing a portion of said sleeve, said heating pipe means being formed with an expansion section of progressively increasing interior diameter,

means for introducing a fluid under pressure into the core, thereby internally pressurizing the sleeve against said heating pipe means to effect a radial expansion of the heated, cured portion thereof within said expansion section, and

cooling means cooperating with said core and sleeve for cooling the expanded sleeve to stabilize it.

4,519,760

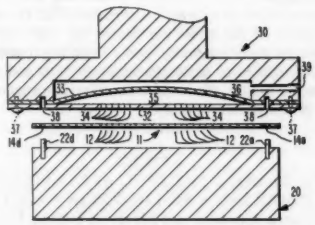
MACHINE FOR FILLING VIA HOLES IN AN INTEGRATED CIRCUIT PACKAGE WITH CONDUCTIVE INK

Ronald A. Norell, Carlsbad, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Apr. 2, 1984, Ser. No. 595,658

Int. Cl.³ B29C *3/00;* **B29F** *3/01;* **B05C** *1/00*

U.S. Cl. 425—113 **11 Claims**



1. A machine for filling a plurality of via holes in a flat workpiece, comprising:

a base member having a flat surface for supporting said flat workpiece such that said via holes are perpendicular to said surface;

a moveable hollow member having an open face that is parallel to said flat surface and surrounds said via holes;

a masking member attached across said open face and having a plurality of via holes that are arranged across said open face in correspondence with said via holes in said workpiece;

a diaphragm inside of said hollow member having a front surface that forms a first cavity with said masking member and having a back surface that forms a second cavity with said hollow member;

a high viscosity substance within said first cavity;

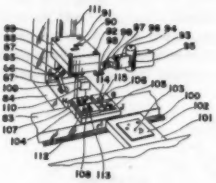
means for pressing said masking member against said base with said workpiece sandwiched therebetween such that said via holes in said masking member and said workpiece are aligned;

said hollow member having an orifice for introducing a fluid under pressure into said second cavity and against the back surface of said diaphragm to thereby squeeze a portion of said high viscosity substance through said via holes in said masking member and into said via holes of said part.

4,519,761
COMBINED MOLDING AND ASSEMBLING APPARATUS

Kazuei Kenmochi, Hirakata; Tadashi Sakairi, Katano; Yoshio Maruyama, Kyoto, and Eizi Itemadani, Sakai, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 5, 1984, Ser. No. 647,825
Claims priority, application Japan, Sep. 8, 1983, 58-165543
Int. Cl.³ B29C *1/00*; B29D *3/00*
U.S. Cl. 425—135 **6 Claims**

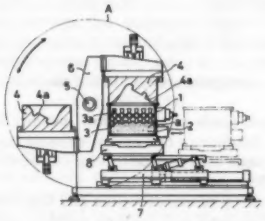


1. A combined molding and assembling apparatus which comprises a conveyor means movable from one position to another position spaced apart from such one position, a pallet frictionally engageable with the conveyor means for movement together therewith, a catch mechanism releaseably engageable with the pallet to hold the pallet at a working position, a molding machine fixedly mounted on a bench of the apparatus adjacent the conveyor means and including a movable plate movable in a direction perpendicular to the direction of movement of the conveyor means for selectively closing and opening a mold assembly, and a handling machine including a head capable of moving selectively into and away from the space, in which the mold assembly operates, during the opening of the mold assembly.

4,519,762
MULTI-MOLD MOLDING APPARATUS FOR PRODUCING A MOLDED SKIN PRODUCT

Tuneo Ishihara, Kawagoe, and Masayosi Uchida, Iruma, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 9, 1983, Ser. No. 521,539
Claims priority, application Japan, Feb. 21, 1983, 58-26203
Int. Cl.³ B29F *5/00*
U.S. Cl. 425—183 **1 Claim**

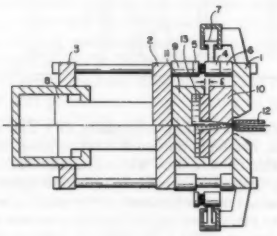


1. An apparatus for manufacturing of a molded skin material including a treating container having at its inner lower portion a space for containing a charged layer of synthetic resin powder, an agitator provided in the space having an agitation blade means for spattering upwards the charged layer of synthetic resin powder, and a metallic mold above the space closing an upper surface of the treating container, the metallic mold being provided with a downwardly directed molding mold surface facing the charged powder layer, the mold surface thereof having means for selectively heating and cooling said mold surface, characterized in that a rotary frame is provided on one side of the heating container, and at least two said metallic molds are disposed on the rotary frame to be at rotationally symmetrical positions, means are provided for rotating the frame and the treating container is so arranged as to be retreated outside a rotation loci of these metallic molds by means for advancing and retreating.

4,519,763
APPARATUS FOR INJECTION COMPRESSION MOLDING

Shunsuke Matsuda, Osaka; Katsuaki Mitani, Kyoto; Hironori Yoda, Ueda, and Kesaji Nishizawa, Nagano, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka and Nissei Plastic Industrial Co., Ltd., Nagano, both of, Japan

Filed Mar. 25, 1983, Ser. No. 479,071
Claims priority, application Japan, Mar. 29, 1982, 57-51711; Mar. 29, 1982, 57-51715; Mar. 29, 1982, 57-51716; Mar. 29, 1982, 57-51719
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—192 R **30 Claims**



1. An injection compression molding apparatus comprising:
a mold unit having a stationary die plate, a mounting plate fixed to said stationary die plate and a mold plate on said mounting plate, a movable die plate movable toward and away from said stationary die plate and having a movable mold plate thereon and defining a mold cavity with said mold plate on said stationary die plate;
an injection nozzle directed into said mold cavity for injecting a resin to be molded into said cavity;
a fixed supporting plate;
main drive means having a main cylinder supported on said supporting plate and a main cylinder ram having the outer end connected to said movable die plate for moving said movable die plate between a position in which said mold plates are fully closed and a position in which said mold plates are open to permit discharge of a molded product; and
compression stroke setting means for blocking movement of said movable die plate in the direction toward said stationary die plate at a position spaced a distance away from the fully closed position corresponding to a desired compression stroke of said mold plate, and comprising adjustment means positioned between said stationary die plate and said movable die plate, at least part of said adjustment means which has a dimension in the direction of movement of said movable die plate greater than said compression stroke being movable laterally of the said direction of movement of said movable die plate for permitting said movable die plate to move to the fully closed position, and drive means connected to said adjusting means for moving at least said part of said adjusting means in the lateral direction.

4,519,764
APPARATUS FOR FABRICATING POLYCRYSTALLINE SILICON WAFER

Yasuhiro Maeda; Takashi Yokoyama, and Shinichi Yagihashi, all of Sapporo, Japan, assignors to Hoxan Corporation, Sapporo, Japan

Division of Ser. No. 373,039, Apr. 29, 1982,. This application Aug. 27, 1984, Ser. No. 644,548
Claims priority, application Japan, Apr. 30, 1981, 56-66021
Int. Cl.³ B29C *5/04*
U.S. Cl. 425—256 2 Claims

1. In an apparatus for fabricating a polycrystaline silicon wafer, said apparatus having:

(a) a centrifugal zone having a defined outer rising peripheral edge (**15**) which encloses said zone;

(b) a dispensing zone located over the centrifugal zone adapted for pouring a predetermined measured quantity of molten silicon at about the center of said centrifugal zone; and,

(c) means for cooling a silicon layer which is poured over the surface of said centrifugal zone;, the improvement in said apparatus, comprising, in combination:

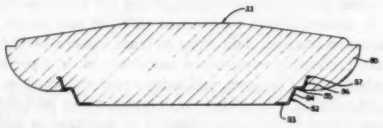
(d) a turntable (3′) disposed in said centrifugal zone under said dispensing zone, said outer rising peripheral edge (**15**) being a wall around said centrifugal zone; and,

(e) a wafer tray (**17**) disposed on said turntable (3′) said wafer tray (**17**) having a second peripheral edge (8′), the zone wall being higher than said second peripheral edge (8′), said wafer tray (**17**) being somewhat smaller in size than the centrifugal zone, and having a bottom plate with a wafer-forming surface (3″), the space between the tray second peripheral edge (8′) and said wall defining a recovery zone (**16**), so that said molten silicon liquid from said dispensing zone is poured substantially onto the center of said wafer tray (**17**), and, the molten silicon liquid flows radially outwards by the centrifugal force created by the rotation of the turntable (3′) which also rotates the wafer tray (**17**), excess molten liquid overflowing the second peripheral edge (8′) and falls and solidifies in the recovery zone (**16**) so that the silicon base material can be recovered and reused.

4,519,765
MOLD

Charles F. Abrams, 4311 Lemp Ave., Studio City, Calif. 91604

Filed Oct. 27, 1983, Ser. No. 545,921
Int. Cl.³ B28B *1/02;* B28C *1/00*
U.S. Cl. 425—263 18 Claims

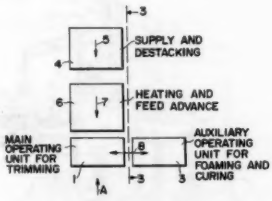


1. An improved plaster mold having an increased useful life, said mold having a top surface for forming ceramic ware and a bottom surface for frictional engagement with jigger rotating means having a substantially horizontal ring-like upper surface; the improvement comprising an abrasion resistant ring of reinforcing material affixed to the bottom surface of said mold at the junction between said mold and said surface of said rotating means whereby said reinforcing material protects said mold at said junction thereby reducing wear thereto.

4,519,766
APPARATUS FOR MANUFACTURING THREE-DIMENSIONAL WORK PIECES

Ernst M. Spengler, Heusenstamm, Fed. Rep. of Germany, assignor to Stanztechnik GmbH R+S, Frankfurt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 260,418, May 4, 1981, Pat. No. 4,405,537, which is a continuation-in-part of Ser. No. 965,745, Dec. 4, 1978, Pat. No. 4,273,738. This application Apr. 18, 1983, Ser. No. 485,739
Int. Cl.³ B29C *17/04*
U.S. Cl. 425—302.1 20 Claims


SUPPLY AND DESTACKING
HEATING AND FEED ADVANCE
MAIN OPERATING UNIT FOR TRIMMING
AUXILIARY OPERATING UNIT FOR FOAMING AND CURING

1. An apparatus for manufacturing a three-dimensional work piece, comprising a first station including primary mold means for holding an initially flat blank work piece, means movably supporting said primary mold means in said first station, first drive means operatively connected to said primary mold means for reciprocating said primary mold means in a given direction, said primary mold means shaping said flat blank work piece of plastics material into a molded blank work piece which assumes the form of the primary mold means, a second station arranged next to said first station, said first drive means moving said primary mold means back and forth between said first and second stations, said second station comprising first secondary mold means (**75**) movably mounted for cooperation with said primary mold means which still hold the molded blank work piece, second drive means operatively connected to said first secondary mold means for moving the first secondary mold means relative to said primary mold means, second secondary mold means movably supported in said first station, third drive means operatively connected to said second secondary mold means for moving the second secondary mold means in said first station relative to said primary mold means still holding the molded blank forming said three-dimensional work piece, trimming tool means operatively supported by said first or second secondary mold means for trimming the three-dimensional work piece while it is still held by said primary mold means, and fourth drive means operatively connected to said trimming tool means for moving the trimming tool means relative to a three-dimensional plane defined by at least one of said mold means, whereby a work piece remains on said primary mold means during all operational steps of the apparatus.

4,519,767
TRANSFER APPARATUS FOR A RECORD MOLDING PRESS

Harry H. Westerman, Jr., Danville, Ind., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 12, 1984, Ser. No. 619,986
Int. Cl.³ B29D *17/00*
U.S. Cl. 425—308 7 Claims

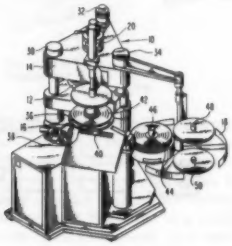
1. In a record molding press having (a) a record pressing

station for use with opposing molding platens on which record stampers are mountable for molding a charge of thermoplastic composition into a record having flash about the outer edge thereof and (b) a record trimming station having means for removing flash from the outer edge of a record; the apparatus for transferring a record with flash on its outer edge from the record pressing station to the record trimming station comprising in combination:

a clamp means having a closed and an opened position and an operating means for opening and closing the clamp means;

said clamp means in the closed position having an inside diameter capable of holding a molded record by flash formed on the outer edge of the record and in the open position having an opening larger than the diameter of the flash formed on the outer edge of the record;

said clamp means being positioned at a predetermined location for oscillation between the record pressing station



and the record trimming station and being comprised of first and second opposing pivotally connected clamp halves each having a semicircular inner ring portion which together form the inside diameter of the clamp means;

said clamp halves further being operatively connected to the operating means for opening and closing the clamp means whereby when the clamp means is located in the closed position about molding platens in the record pressing station and a charge of a thermoplastic composition is molded between stampers mounted on the molding platens, a record is molded having flash formed about the outer edge of the record in gripping engagement with the inner diameter of the clamp means and whereby after oscillating from the record pressing station to the record trimming station and the clamp means is moved to the open position by the operating means the record is released for trimming of the flash from the outer edge of the record at the record trimming station.

4,519,768

APPARATUS FOR HORIZONTALLY CASTING CONCRETE

Toshio Murai, Kashiwa; Hayao Aoyagi, Chiba; Masahiko Furukawa, Kashiwa; Hiromichi Yamada, Matsudo; Tateo Kawamura, Tokyo; Yoshihiro Ishikawa, Kashiwa; Akio Sakamoto, Iwatsuki; Toshiaki Tsuchiya, Yokohama; Takashi Shiozaki, Abiko; Hirokuni Kubota, Kashiwa; Isoji Okada, Yokohama; Jiro Ishii, Ibaragi; Fumio Fujii, Yotsukaido; Masakazu Nagao, Tokyo; Masamitsu Kikuchi, Tokyo; Morio Ishii, Tokyo; Yoshimasa Sasaki, Sapporo; Katsushi Tanaka, Kobe, and Tadashi Itakura, Miki, all of Japan, assignors to Takenaka Komuten Co., Ltd. and Kyokuto Kaihatsu Kogyo CO., Ltd., both of, Japan

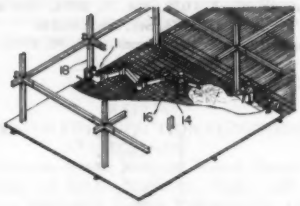
Filed Oct. 27, 1983, Ser. No. 545,913

Claims priority, application Japan, Oct. 29, 1982, 57-164433[U]; Apr. 25, 1983, 58-61783[U]; Jul. 27, 1983, 58-117058[U]; Jul. 27, 1983, 58-117059[U]

Int. Cl.³ B28B *21/14, 1/32*

U.S. Cl. 425—456 **8 Claims**

1. An apparatus for horizontally casting concrete comprising a horizontally foldable multilink support arm composed of an attachment frame, a proximal boom, intermediate booms, and a distal boom which are pivotally coupled by joint tubes, a drive mechanism composed of worm wheels mounted on said joint tubes and worm gears mounted on said booms and held in



mesh with said worm wheels for enabling said support arm to move in articulatory motion, a concrete pressure-feed pipe extending from a pump along said booms and through said joint tubes with swivel joints, and an attachment jig mounted on said attachment frame for being mounted on a column.

4,519,769

APPARATUS AND METHOD FOR THE COMBUSTION OF WATER-IN-OIL EMULSION FUELS

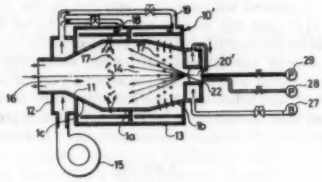
Akio Tanaka, No. 565, Tobori, Himeji-shi, Hyogo, Japan

Continuation-in-part of Ser. No. 376,048, May 7, 1982, abandoned. This application Nov. 15, 1983, Ser. No. 552,192

Claims priority, application Japan, Jun. 2, 1983, 58-98507

Int. Cl.³ F23J *7/00*

U.S. Cl. 431—4 **2 Claims**



1. A method for the combustion of a water-oil emulsion fuel having at least a water content of about forty percent comprising simultaneously and separately supplying water, oil and compressed air to a nozzle having a single outlet for mixture of said water and oil in said nozzle, jetting the water-oil emulsion fuel by means of said compressed air from said nozzle into a combustion chamber defined by an inner vessel attached to the nozzle, preheating compressed secondary air in a pre-heating chamber located between said inner vessel and an outer vessel and introducing said preheated compressed air into the combustion chamber through a plurality of apertures in said inner vessel to compress the flame of the jetted water-oil emulsion fuel and force it to swirl and remain in the combustion chamber for combustion at a temperature of 700° to 1000° C. thereby causing the micro-explosion of the water particles and at the same time the pyrolysis of the water-oil emulsion fuel.

4,519,770

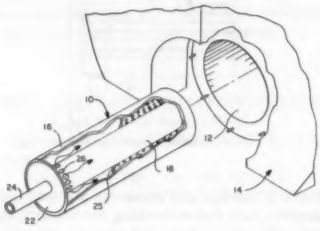
FIRETUBE BOILER HEATER SYSTEM

John P. Kesselring, Mountain View; Robert M. Kendall, and Wayne V. Krill, both of Sunnyvale, all of Calif., assignors to Alzeta Corp., Mountain View, Calif.

Continuation-in-part of Ser. No. 164,831, Jun. 30, 1980, abandoned. This application Apr. 21, 1983, Ser. No. 487,068

Int. Cl.[3] F23D *13/12*

U.S. Cl. 431—7 11 Claims



1. A burner for use in a heater having a combustion chamber with firetube walls, the burner including the comination of a burner shell comprised of a matrix of ceramic fibers having interstitial spaces between the fibers providing a flowpath for an air-fuel mixture with combustion of the mixture occurring in a reaction zone along a shallow outer layer of the shell whereby heat transfers primarily by radiation from the reaction zone outwardly to the firetube walls of the combustion chamber, mounting means for supporting the burner shell and for mounting the shell in the heater wherein said burner shell is separable and detachable from the combustion chamber, and with the reaction zone spaced from and in direct line of radiant view with the firetube walls of the combustion chamber, and means for directing a flow of the air-fuel mixture into the shell and outwardly through the fiber matrix.

4,519,771

FLAME DETECTION SYSTEM WITH ISOLATION BETWEEN BURNER AND ELECTRONIC CONTROL DEVICE

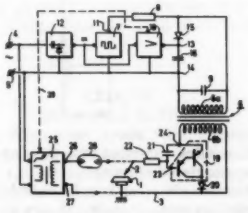
Jean-Claude G. Six, Versailles; Paul Claeys, Saint-Mande, and Michel Guillaume, Paris, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 31, 1983, Ser. No. 481,002

Claims priority, application France, Apr. 2, 1982, 82 05773

Int. Cl.[3] F23N *5/00;* F23Q *23/00*

U.S. Cl. 431—25 17 Claims



1. A method of detecting a burner flame using the rectifying effect of the flame which comprises: applying a signal from an a.c. generator between an electrode in contact with the flame and the burner which functions as a counter-electrode, electrically isolating a first part of the circuit which comprises the a.c. generator and a voltage detector from a second part of the circuit which includes the burner and the electrode by means of an isolating transformer, whose primary winding is coupled directly to the voltage detector and via a resistor to the a.c. generator and whose secondary winding is coupled to a secondary circuit, the presence of a flame producing a rectified current in the secondary circuit which provides damping of said secondary circuit, which damping is transferred to the primary of the transformer, and measuring the presence or absence of a flame by means of a variation of a rectified and smoothed voltage developed at the input of the voltage detector.

4,519,772

HEATING DEVICE FED WITH FREE-FLOWING FUEL

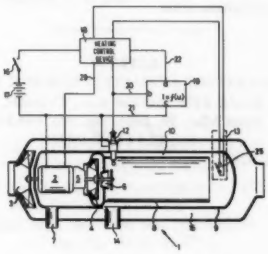
Bernd Mittmann, Munich, Fed. Rep. of Germany, assignor to Webasto-Werk. W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,540

Claims priority, application Fed. Rep. of Germany, Dec. 28, 1982, 3248412

Int. Cl.[3] F23Q *9/08*

U.S. Cl. 431—45 2 Claims



1. In a heating device of the type fed with free-flowing fuel and connected to an on-board voltage source, in particular, a vehicle heating device with a burner assembly which includes a fuel supply, a combustion air fan and a heating element to ignite the fuel/air mixture after a preheating phase, during which at least the combustion air fan is shut off or is operated at less than the operating blower output, and with a switching device which automatically turns on or switches the combustion air fan to its operating blower output following completion of the preheating phase, the improvement wherein the switching device comprises a voltage-dependent, time-function element which presets a preheating time for the heating element based on the magnitude of on-board voltage applied thereto, and being operable to decrease preheating duration as the on-board voltage increases.

4,519,773

DUAL CANNISTER GAS HOUSING

Mark G. Parish, Brown Deer, and Roy M. Rulseh, Milwaukee, both of Wis., assignors to Aqua-Chem, Inc., Milwaukee, Wis.

Filed Feb. 25, 1983, Ser. No. 469,583

Int. Cl.[3] F23C *5/28;* F23N *1/00*

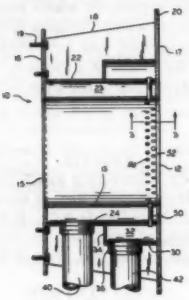
U.S. Cl. 431—176 9 Claims

1. A burner device comprising a combustion zone and means for introducing two gases having different heating values thereto, said introducing means comprising:

a first chamber associated with said burner and having means for receiving a first gas and a first plurality of orifice means coupling said first chamber to said combustion zone;

a second chamber associated with said burner and surrounding said first chamber and having means for receiving a second gas and a second plurality of orifice means coupling said second chamber to said combustion zone, said second plurality of orifice means comprising a plurality of

tubes passing through said first chamber and coupling said second chamber to said combustion zone thereby preventing mixing of said first gas and said second gas except in said combustion zone.



4,519,774

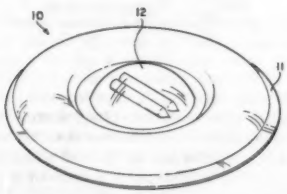
TEMPERATURE ACTUATED BURNER IGNITER

Clifford M. Shedd, 5109 Mortier Ave., Orlando, Fla. 32812

Filed Mar. 29, 1984, Ser. No. 594,811

Int. Cl.³ C06C *9/00*

U.S. Cl. 431—267 **20 Claims**



1. A low cost igniter comprising a multi capsule of low strength material, said capsule being divided into at least two separate compartments, with one of said compartments being filled with a freezable fluid, and another of said compartments containing a first ingredient that will function in the presence of a selected second ingredient to bring about combustion, said compartment containing said first ingredient being disposed in the immediate vicinity of a quantity of said selected second ingredient, so that on the occasion of a freezing temperature, the freezable fluid in said capsule will freeze and expand, fracturing the compartments of said capsule substantially simultaneously, thus leading to a combination of the first ingredient with the selected second ingredient, as will bring about immediate combustion.

4,519,775

BURNER APPARATUS

Muneo Tao, and Fumihiko Migaki, both of Yamatokoriyama, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodoma, Japan

Filed Feb. 4, 1983, Ser. No. 464,118

Claims priority, application Japan, Feb. 10, 1982, 57-20003

Int. Cl.³ F24C *5/04*; F23D *13/04*

U.S. Cl. 431—344 **3 Claims**

1. A burner apparatus comprising:

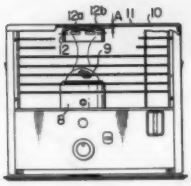
a cabinet;

a combustion cylinder disposed in said cabinet;

a top panel having a lower surface disposed above said combustion cylinder and exhaust holes formed in a peripheral portion thereof;

a flame-shielding member attached to a portion of the lower surface of said top panel facing said combustion cylinder; and

a discharge means associated with said flame-shielding member for horizontally discharging flames rising from said combustion chamber and streaming into said flame-shielding member, said flame-shielding member having an open bottom cylinderical shape and a peripheral wall and a top closed by a top wall which is spaced from said portion of the lower surface of said top panel by means providing a predetermined gap, said discharge means including at least one opening formed in said peripheral wall of said flame-shielding member.



4,519,776

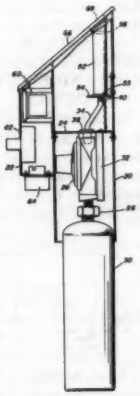
APPARATUS FOR ATTRACTING INSECTS

Sal G. DeYoreo, Andover, and David P. Stevens, Billerica, both of Mass., assignors to Armatron International, Inc., Melrose, Mass.

Filed Jul. 8, 1983, Ser. No. 511,971

Int. Cl.³ F23D *13/00*

U.S. Cl. 431—328 **6 Claims**



2. An apparatus for attracting insects to an insect trapping device, said apparatus comprising:

enclosure means defining an interior chamber with inlet and outlet openings communicating therewith;

a catalyst arranged in said chamber;

a source of pressurized combustible fluid;

means including a normally closed valve for connecting said source to said inlet opening;

a first electrically operable means for opening said valve to thereby permit combustible fluid to flow from said source via said inlet opening into said chamber;

a second electrically operable means for heating said catalyst to an elevated temperature at which said catalyst ignites

the combustible fluid in said chamber and thereafter sustains an exothermic reaction, thereby producing a mixture of carbon dioxide and moisture which exits from said chamber via said outlet opening, said second electrically operable means comprising an electric heating element arranged in said chamber adjacent to said catalyst;

a normally closed electric switch connected in series with said electric heating element, said switch being of the type which opens at said elevated temperature; a transformer of the type adapted to be powered by an AC power source; and

means for connecting said first and second electrically operable means inparallel with said transformer.

4,519,777

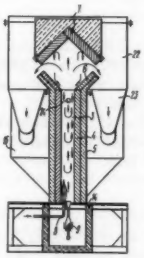
METHOD AND APPARATUS FOR BLOATING GRANULAR MATERIAL

Yakub A. Akhtyamov, ulitsa Lipetskaya, 17, kv. 16, Chelyabinsk, U.S.S.R.

Filed Sep. 8, 1982, Ser. No. 415,775

Int. Cl.³ F27B *14/00*; F27D *1/08*; C04B *31/22*

U.S. Cl. 432—13 **11 Claims**



1. A method of bloating granular material comprising the steps of:

forming a flow of rising gases heated to a temperature of 800°–1000° C.;

forming a flow of the raw granular material;

said flow of the raw granular material being introduced directly into said flow of the rising gases heated to a temperature of 800°–1000° C. at a velocity which is 1.5 to 9 times the velocity of said flow of gases;

roasting said raw granulated material to obtain bloated granules of said material, the resulting material comprising completely bloated and partially bloated granules;

carrying the thus obtained bloated granular material by the flow of exit gases away from the zone of roasting for separation; and

returning said partially bloated granules into the roasting zone for further roasting until they are completely bloated.

4,519,778

HEATABLE GODET

Paul von Burg, Winterthur; Armin Wirz, Ossingen, and Felix Graf, Winterthur, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Nov. 18, 1983, Ser. No. 553,044

Claims priority, application Switzerland, Dec. 6, 1982, 7074/82

Int. Cl.³ F27D *21/00*; F22B *37/46, 37/42*

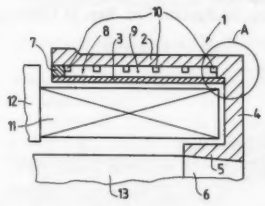
U.S. Cl. 432—35 **4 Claims**

1. A heatable godet comprising

means for defining an enclosed space for a heatable medium;

an exhaust path extending from said space to atmosphere;

a safety outflow device in said path for venting the heatable medium from said space, said safety outflow device including an outflow opening communicating with said space and fusible material within said opening to hermetically close off said opening, said material having a predetermined melting point for melting at a predetermined temperature in said space to open said opening for the exhaust of the medium; and



a narrowed throttle region in said path sized to exhaust a flow of the heatable medium from said space over a time period of from 0.5 seconds to 20 seconds.

4,519,779

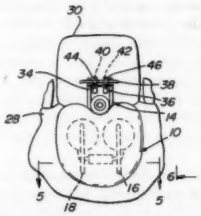
ORTHODONTAL ELECTRICAL DEVICE AND METHOD OF EMPLOYING SAME

Nathaniel H. Lieb, Narberth, Pa., assignor to Penn-Med Technology, Inc., West Conshohocken, Pa.

Filed Mar. 30, 1984, Ser. No. 595,096

Int. Cl.³ A61C *7/00*

U.S. Cl. 433—18 **5 Claims**



1. An orthodontal electrical device for assisting in the repositioning of a tooth in the mouth of a patient, said device being characterized by:

a. a housing attachable to a tooth to be repositioned and moveable with said tooth;

b. current generating means within said housing;

c. an anodic electrode connected to said current generating means and being moveable with said housing, said anodic electrode being located adjacent a surface of the housing facing the gingival tissue when said housing is attached to the tooth to be repositioned, said anodic electrode being positioned for engaging the gingival tissue adjacent the tooth to be repositioned for engaging the gingival tissue adjacent the tooth to be repositioned at a location substantially in a direction of desired tooth movement; and

d. a cathodic electrode connected to said circuit generating means and being moveable with said housing, said cathodic electrode being located adjacent the same surface of the housing as the anodic electrode and bing positioned for engaging the gingival tissue adjacent the tooth to be repositioned on the side of said tooth opposed to the anodic electrode.

4,519,780
DENTAL HANDPIECE

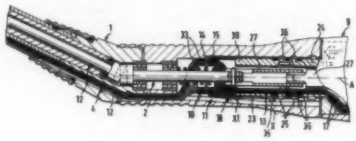
Ernst Strohmaier, Bad Schussenried; Heinrich Reich, Hochdorf, and Bernd Wagner, Biberach, all of Fed. Rep. of Germany, assignors to Kaltenbach & Voigt GmbH & Co., Biberach, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,213

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215210

Int. Cl.³ A61C *1/00*

U.S. Cl. 433—29 **29 Claims**



1. A dental handpiece comprising means provided at one end of the handpiece to mount a dental implement, drive means provided in the handpiece to operate the dental implement when the latter is mounted on the handpiece, a connection piece pivotally connected to a second end of the handpiece which is remote from said one end thereof so as to permit relative rotation between the handpiece and the connection piece, means provided in the connection piece to enable a handpiece-supply line to be coupled therewith, a light source, and a light guide having a light-receiving end arranged to receive light from said light source and a light-emitting end arranged to direct light to a treatment region adjacent to the dental implement, wherein:

(a) the light guide is arranged to extend within the handpiece and the connection piece;

(b) the light guide is transversely divided into separate first and second guide portions in the region of the connection between the handpiece and the connection piece;

(c) the first guide portion extends within the connection piece and has a first end which provides said light-receiving end of the light guide and a second end which is located in said connection region, and the second guide portion extends within the handpiece and has a first end which is located in said connection region and a second end which provides said light-emitting end of the light guide; and

(d) a pair of annular light-transmitting arrangements are provided one at each of said second end of the first guide portion and said first end of the second guide portion, said annular light arrangements providing for transmission of light therebetween whereby light admitted to said first end of the first guide portion is transmitted via the first guide portion, said pair of annular arrangements, and said second guide portion to be emitted from the second end thereof, and one of said annular arrangements being provided in the handpiece and the other of said annular arrangements being provided in the connection piece.

4,519,781
TEACHING TOOL

Jeanette D. Boyd, P.O. Box 404, Cross Rd., Kingston 5, Jamaica

Filed Feb. 29, 1984, Ser. No. 584,737

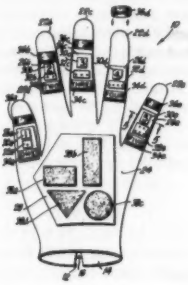
Int. Cl.³ G09B *1/06*

U.S. Cl. 434—156 **11 Claims**

1. A teaching tool comprising:

a glove adapted to be worn on the hand and formed from a flexible fabric material said glove including a plurality of glove fingers adapted to receive fingers of the hand and a glove palm adjacent and attached to each of said glove fingers; and

a plurality of tags releasably attached and readily reattachable to at least portions of said glove fingers and said glove palm, said plurality of tags including a first plurality of tags each of which defines a different shape, a second plurality, each of which displays a number and a third plurality each of which displays at least one letter, whereby said tags can be selectively removed from and reattached to said glove as part of a teaching exercise.



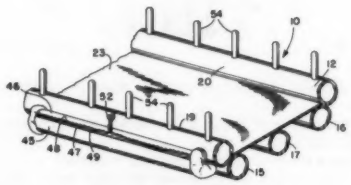
4,519,782
ESCAPE SLIDE AND LIFE RAFT

John M. Fisher, Cuyahoga Falls, Ohio, assignor to The B. F. Goodrich Company, New York, N.Y.

Continuation of Ser. No. 122,334, Feb. 19, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,866

Int. Cl.³ B63C *9/04;* **B64D** *25/14*

U.S. Cl. 441—40 **2 Claims**



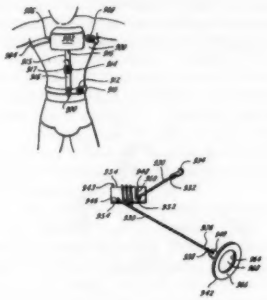
1. An escape slide and life raft assembly adapted to be inflated and extend from an elevated position to a lower surface, said assembly comprising a slide portion having a longitudinally extending inflatable side tube at each side thereof, an outrigger portion positioned adjacent said side tube, said outrigger portion having an inflatable support tube, in fluid communication with said side tube, a flexible passenger supporting sheet member extending between said support tube and said side tube, and a reefing means for retaining said outrigger portion against said slide portion, means for inflating said assembly to a first predetermined pressure while said outrigger portion is in the reefed condition, said reefing means including a continuous flap of sheet material having substantially the length of the support tube and extending around said support tube of said outrigger portion for urging said support tube against said side tube so that upon inflation of said assembly with said outrigger portion retained against said slide portion said support tube will only partially inflate and reinforce said side tube, said reefing means including a release means to release said reefing means to permit full inflation of said support tube so that during operation of said assembly as a raft said outrigger portion will provide space on said flexible sheet member for additional passengers and said assembly being inflated to a second predetermined pressure with said outrigger portion in the extended condition after release of said reefing means by said release means.

4,519,783

SWIMMER'S RESTRAINING APPARATUS

Earl P. Burke, Jr., c/o Peltex, 1100 Louisiana, 50th Floor, Houston, Tex. 77002

Filed Nov. 8, 1982, Ser. No. 439,927
Int. Cl.[3] A63B *69/12*
U.S. Cl. 441—117 1 Claim



1. An apparatus for restricting the longitudinal movement of a swimmer in a body of water comprising:

a floatation mass of material of less density than water and of sufficient buoyancy to provide flotation along the longitudinal axis of said swimmer;

an adjustable strap attached to and connecting opposite sides of said flotation mass;

an adjustable belt for removably fastening about the waist of said swimmer;

a strip demountably coupling said flotation mass and said adjustable belt in fixed relationship, one end of said strip being attached to said flotation mass and the other end being attached to said belt;

a connection ring extending a fixed distance from said belt;

a flexible line having a snap fitting at one end, said snap fitting removably attached about said connection ring;

an anchor being equipped on one side with a raised eyelet and on the other side with a suction cup capable of removably affixing said anchor to a fixed object, said raised eyelet engaging other end of said flexible line;

adjustable means about said flexible line for varying the length of said flexible line in relation to the depth of said body of water; and

a suction mating plate, said plate having a generally flat disk on one side and a suction matig area on the other side, said suction mating area having an outer diameter generally matching the inner diameter of said suction cup, said suction mating plate being removably inserted into other side of said anchor.

4,519,784

METHOD OF INSERTING A CENTER ELECTRODE IN A SPARK PLUG INSULATOR

Rudolf Pollner, Bamberg, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 22, 1983, Ser. No. 477,617
Claims priority, application Fed. Rep. of Germany, Apr. 6, 1982, 3212770
Int. Cl.[3] H01T *21/02*
U.S. Cl. 445—7 22 Claims

1. Method of inserting a center electrode (**23, 23'**) in an insulator body (**15, 15'**) of a spark plug having a terminal end portion and an ignition end portion,

in which the spark plug has a metal body (**11**) formed with a central opening, the insulator body (**15**) is secured in the central opening of the metal body, and the insulator body is formed with a central aperture or opening or bore (**21, 21'**);

a connection terminal post (**22, 25**) located in the central opening of the insulator body and extending outwardly thereof at the terminal end portion of the spark plug;

conductive means (**24**) positioned in the central bore, mechanically and electrically connected to the terminal post;

the center electrode (**23, 23'**) being located in the central opening of the insulator, adjacent the ignition end portion, in electrically conductive connection with the conductive means (**24**),

the center electrode including a body (**28, 28'**) having an outer surface;

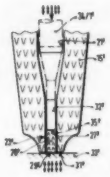
the insulator body (**15, 15'**) having an inner surface (**32, 32'**) adjacent said outer surface;

a heat-resistant, electrically conductive coating or layer (**27, 27'**) located on at least some of the surface areas of at least one of said surfaces, and in electrical connection with said conductive means (**24**),

said center electrode and said insulator body (**15**) consisting of elements of ceramic material, which materials, upon heating to sintering temperature, are subject to material shrinkage, and which materials have essentially similar temperature coefficients of expansion,

said method comprising the steps of

(a) providing a ceramic body (**28, 28'**) of the ceramic material of the center electrode, in unsintered condition, and including a heat-volatile additive therein which makes



said ceramic body form and shape retentive at room temperature, but permitting plastic deformation under application of external energy thereto;

(a-1) presintering the insulator body (**15, 15'**) to establish the shape thereof;

(a-2) applying said electrically conductive coating or layer to one of said surfaces;

(a-3) introducing said ceramic body (**28, 28'**) into the end portion (**32, 32'**) of the central bore (**21**) of the insulating body (**15**);

(b) applying external energy to said ceramic body (**28, 28'**) to render said ceramic body plastically deformable;

(c) deforming said ceramic body (**28, 28'**) while in plastically deformable condition and while positioned in the end portion (**32, 32'**) of the opening (**21, 21'**) of the insulator body, to completely fill said opening and to engage said surfaces, with the heat-resistant electrically conductive coating or layer interposed;

(d) heating the ceramic body (**28, 28'**) to render volatile said additive and thereby remove the additive from the ceramic body; and

(e) finish sintering, and sintering together said presintered insulating body (**15**) and the ceramic body (**28, 28'**) with the heat-resistant electrically conductive coating or layer (**27, 27'**) therebetween.

4,519,785

LIFE TUNGSTEN FILAMENT FOR INCANDESCENT LAMP

John W. Shaffer, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 580,273, Feb. 16, 1984, abandoned, which is a continuation of Ser. No. 368,543, Apr. 15, 1982, abandoned. This application Nov. 5, 1984, Ser. No. 667,407

Int. Cl.³ H01J *9/12*

U.S. Cl. 445—48 **6 Claims**

1. In a method of increasing the life of tungsten filaments employed as a light emitting element in a lamp, the steps comprising:

forming a filament from a length of tungsten wire;

placing said filament in a closed environment;

providing said closed environment with a non-hydrogen containing gas fill which includes tungsten fluoride;

applying sufficient electrical energy to said filament to cause hot spots on said filament to incandesce;

maintaining said hot spots on said filament at incandescence for a sufficient period of time to substantially remove said hot spots from said filament;

withdrawing said electrical energy and removing said filament from said closed environment; and

subsequently operatively sealing said filament in a lamp envelope having a fluoride-free atmosphere.

4,519,786

TOY-FIGURE

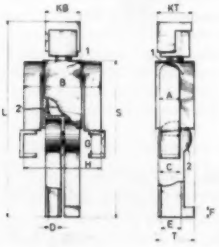
Peter Larws, Schlappmühler Pfad 13, D 6390 Usingen, Fed. Rep. of Germany

Filed Jun. 23, 1983, Ser. No. 506,976

Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223358

Int. Cl.³ A63H *3/16*

U.S. Cl. 446—97 **17 Claims**



1. A toy-figure with legs, arms, hands and a head, for use in conjunction with modular toy-building block systems of the plug-in-type using modules which are provided with rectangular passage openings, wherein the toy-figure has the following measurements:

width across arms: $B=2a$

width of torso: $RB=a$

depth of torso: $RT=a$

depth of total figure: $T=a$,

a being the basic length unit of the modular building block system.

4,519,787

MECHANICAL TOY BULL

Lanny J. Williams, 1325 Peach Tree Ct., Frederick, Md. 21701

Filed Sep. 14, 1982, Ser. No. 418,025

Int. Cl.³ A63H *11/00*

U.S. Cl. 446—313 **17 Claims**

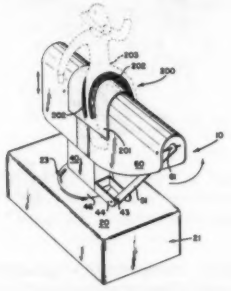
1. A toy mechanical animal designed to simulate the actions of a full size rodeo training device, commonly referred to as a "mechanical bull" wherein the toy comprises

a base member

a vertical support column rotatably disposed on an elongated vertically disposed conductive rod which is received within the base member;

a miniature animal body moveably attached to the vertical support column; and

motor means associated with the toy to impart rotary motion to the miniature animal body in the horizontal and vertical planes wherein the motor means comprises.



a first motor mounted in the base member, and operatively connected to the vertical support column, and

a second motor mounted on top of the vertical support column, and operatively connected to the miniature animal body, wherein the first and second motors are powered by electricity, and the vertically disposed conductive rod is provided with an electrically insulated jacket that leaves only the areas adjacent the ends of the tubular rod exposed, and the vertical support column is provided with a plurality of electrically insulated partitions, which engage the insulated jacket on the conductive rod.

4,519,788

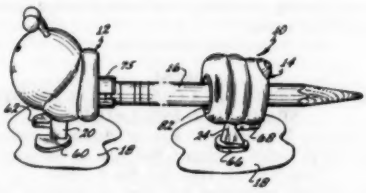
TOY HAVING TWO BODIES CAPABLE OF CONNECTING TO A THIRD BODY

Yutaka Ajiro, and Michihiro Kozuka, both of Tokyo, Japan, assignors to Tomy Kogyo Company, Incorporated, Japan

Filed Jul. 25, 1983, Ser. No. 516,552

Int. Cl.³ A63H *3/22, 3/16*

U.S. Cl. 446—356 **11 Claims**



1. A toy which comprises:

a front body, said front body including connecting means for connecting said front body to another body;

said front body further including motor means located in said front body;

a left and right front appendage member each pivotally mounted on said front body, each of said front appendage members being essentially vertically oriented and including a lower end, said lower ends of said front appendage members forming surface contact points for said front

body whereby said front body is supported on a support surface by said front appendage members' lower ends contacting said surface;

said motor means operatively associated with each of said front appendage members to alternately move said front appendage members, said lower ends of said front appendage members moving in a circuit in response to movement of said front appendage members, the lower end of one of said front appendage members moving through said circuit one hundred and eighty degrees out of phase with respect to the movement of the lower end of the other of said front appendage members through said circuit, said circuit of movement of each of said lower ends of said front appendage members comprising said lower ends of said front appendage members moving forward, then downward, then backward and then upward to complete said circuit with the lower ends of said front appendage members contacting said surface as they respectively move backwardly;

a rear body, said rear body including connecting means for connecting said rear body to another body;

a left and right rear appendage member, each of said rear appendage members independently pivotally mounted to said rear body, each of said rear appendage members being essentially vertically oriented and including a lower end, the lower ends of said rear appendage members forming surface contact points for said rear body whereby said rear body is supported on said surface by said rear appendage members' lower ends contacting said surface;

each of said lower ends of said rear appendage members of a sufficient weight such that in the absence of any outside forces said rear appendage members' lower ends are biased downwardly by gravity to essentially vertically orient said rear appendage members, each of said rear appendage members' lower ends independently displaceable rearwardly if said lower ends of said rear appendage members are engaged against said surface and simultaneously said rear body is moved forward;

said front and rear bodies directly connectable to each other by said respective connecting means on said front and rear bodies and indirectly connectable to each other by connecting said respective connecting means on said front and rear bodies to a third body and when so connected to each other said front and rear bodies being moved forward in unison as each of said lower ends of said front appendage members moves rearwardly after said contact with said support surface and further when so connected to each other said front and said rear bodies rocking side to side in unison as said lower ends of said lower appendage members alternately contact said surface;

said lower ends of said rear appendage members alternately being moved rearwardly as said rear body is moved forward by said front body and after being so moved rearwardly, then forwardly under the bias of gravity as said front and rear bodies rock side to side.

4,519,789

COMBINED JUMP MEANS AND TOY VEHICLE WITH SIMULATED STUNT HOOP

Wayne R. Halford, Manhattan Beach; Larry H. Renger, Hawaiian Gardens, both of Calif., and James J. Dooley, Stanley, Hong Kong, assignors to Mattel, Inc., Hawthorne, Calif.

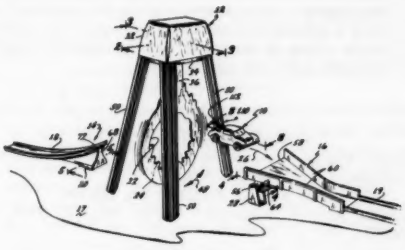
Filed Sep. 30, 1983, Ser. No. 538,007
Int. Cl.³ A63H *18/02*
U.S. Cl. 446—444 **9 Claims**

1. In combination:

a toy vehicle having a spring wound motor to move said vehicle and a shift mechanism for locking and unlocking said motor;

an adjustable-height jump cooperating with said toy vehicle to direct its path when said vehicle is placed thereon with said motor wound and said shift mechanism is released to allow said vehicle to move along said jump; and

a tower having swingably mounted therein a pendulum-action hoop, said hoop having an opening therein spaced from said adjustable-height jump whereby said vehicle moving along and leaving said jump may pass through said opening when said hoop is swinging within said pendulum tower, provided that the speed of the toy vehicle, the height of the adjustable jump, and the swinging action of the pendulum hoop are properly timed and coordinated after the release of said shifting mechanism.

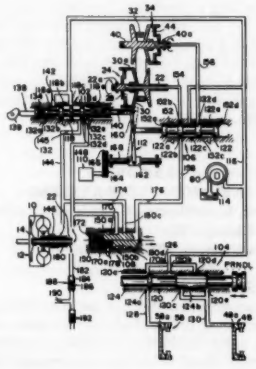


4,519,790

HYDRAULIC CONTROL SYSTEM FOR CONTINUOUSLY VARIABLE V-BELT TRANSMISSION

Sigeaki Yamamuro, Zushi; Hiroyuki Hirano; Yoshiro Morimoto, both of Yokosuka, and Yoshikazu Tanaka, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Mar. 26, 1982, Ser. No. 362,488
Claims priority, application Japan, Mar. 28, 1981, 56-44752
Int. Cl.³ F16H *11/06*
U.S. Cl. 474—18 **7 Claims**



1. A hydraulic control system for a continuously variable V-belt transmission having a V-belt running over a drive and a driven pulley, each having a cylinder chamber and two conical discs, one conical disc of the drive pulley being secured to a drive shaft adapted to be driven by an engine, one conical disc of the driven pulley being secured to a driven shaft, the other conical disc of the drive pulley being controllably movable in an axial direction of the drive shaft in response to a fluid pressure in the cylinder chamber thereof, the other conical disc of the driven pulley being controllably movable in an axial direction of the driven shaft in response to a fluid pressure in the cylinder chamber thereof,

said hydraulic control system comprising:

pumping means for the hydraulic fluid; and

a line pressure regulator valve means connected to said pumping means for regulating the output of the fluid supplied to said line pressure regulating valve means by said pumping means, said line pressure regulator valve means generating a variable output line pressure which is responsive to the position of a spool within the line pressure regulator valve means, wherein the position of said spool is dependent upon continuous inputs from both the output torque of the engine and the reduction ratio between the drive and driven pulleys.

4,519,791

SPROCKET FOR A BICYCLE

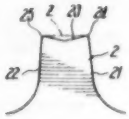
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 23, 1983, Ser. No. 525,694

Claims priority, application Japan, Sep. 3, 1982, 57-134430[U]; Oct. 18, 1982, 57-157732[U]

Int. Cl.³ F16H *55/30*

U.S. Cl. 474—152 **7 Claims**



1. A sprocket for a bicycle comprising: a sprocket body and a number of teeth provided circumferentially at the outer periphery of said sprocket body and engageable with a driving chain at the bicycle, each of said teeth having, with respect to a rotation direction of said sprocket, a front side, a rear side and a top side, and having a front edge between said front side and said top side and a rear edge between said rear side and said front side, and being shaped so that a length between said top side and the axis of rotation of said sprocket body is smaller than that between a phantom plane connecting said front edge and rear edge and said axis of rotation, said front and rear edges being acute-angled respectively.

4,519,792

INFUSION PUMP SYSTEM

Garfield A. Dawe, Lindenhurst, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Dec. 6, 1982, Ser. No. 447,377

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—152 **58 Claims**

1. A valved pumping chamber for use in an infusion delivery pump system including first and second magnetic means and a pump actuating means including a reciprocal operating member, said pumping chamber operating between an upstream portion and a downstream portion of the infusion delivery system comprising:

an inlet port;

an inlet fluid passage means interconnecting with said pumping chamber;

an inlet valve seat having a bore in said inlet fluid passage means;

magnetically permeable flow restricting means constructed and arranged to be biased against said inlet valve seat under the magnetomotive force of said magnetic means;

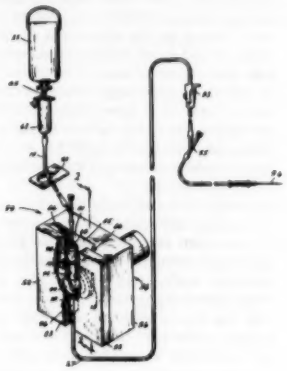
means for providing substantially constant and continuous magnetic force located outside of said inlet fluid passage means which maintain said magnetically permeable flow restricting means in proximity to said inlet valve seat;

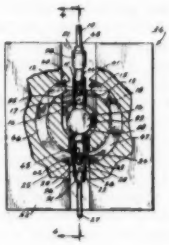
a pumping chamber defining a cavity and flexible means adapted to be engaged by said reciprocal operating member to change the internal volume of said pumping chamber;

an outlet port;

an outlet fluid passage means interconnecting with said pumping chamber;

an outlet valve seat having a central bore disposed in said outlet fluid passage means;





magnetically permeable flow restricting means constructed and arranged to be biased against said outlet valve seat under the magnetomotive force of said second magnetic means; and

means for providing a substantially constant and continuous magnetic force located outside of said outlet fluid passage means which maintain said magnetically permeable flow restricting means in proximity to said outlet valve seat.

4,519,793

CATHETER HOLDER

Eugene R. Galindo, 2926 Highridge Rd., La Cresenta, Calif. 91214

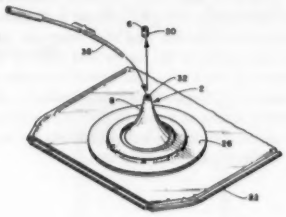
Filed Feb. 9, 1983, Ser. No. 465,302

Int. Cl.³ A61M *25/02*

U.S. Cl. 604—180 **6 Claims**

1. A medical tube holder or the like comprising an integral member having an upper funnel-like portion, an intermediate, conically-shaped portion, and a bottom annular portion, said member being of thin-walled, moldable and conformable material, said bottom annular portion having substantially planar surfaces and the bottom surface thereof being adapted for adhesive securement to a supporting surface or the like, said

funnel-like portion defining a substantially continuously tapered interior surface whereby said funnel-like portion is sev-



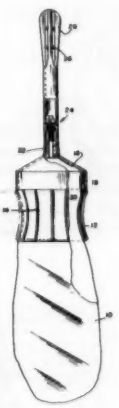
erable for accommodating differing diameter medical tubes or the like in frictional engagement therewith.

4,519,794

VALVE CONTROL OF NOZZLE FLOW FROM DISPOSABLE SYRINGE

Vincent R. Sneider, 3422 Hallcrest Dr., Hampton Hall, Atlanta, Ga. 30319

Filed Oct. 11, 1983, Ser. No. 540,879
Int. Cl.[3] A61M *1/00*
U.S. Cl. 604—212 **20 Claims**



1. A syringe nozzle attachable to a flexible bag for fluid storage and discharge, this nozzle having a fluid flow control slide valve provided in the stem portion of the nozzle, this syringe and slide valve flow control including:

(a) a collapsible bag of thin flexible plastic and having a closed end and an open end;

(b) a collar member of generally tubular configuration and having securing means provided at and on the outer surface thereof;

(c) a hollow nozzle having a distal end adapted for insertion into a body opening, this distal end smoothly contoured and with discharge openings or apertures therein which are in flow communication with the interior of this hollow nozzle, and with this distal end of the nozzle becoming an integral hollow stem forming the exterior member portion of a telescoping section in which inner and outer members are sized so as to be slidable therealong;

(d) a slide valve means provided in said telescoping section and with the outer hollow stem portion slidable over an inner stem portion extending from an enlarged end member, said enlarged end member terminating with a skirt portion sized and adapted to mount and mate with the exterior surface of the collar member, said skirt having means to engage and retain said nozzle on the collar member, said inner stem portion having a fluid passageway therein and terminating with a fixed diameter closed disc-like end cap which is sized so as to be slidable within the inner diameter of the hollow stem portion forming the exterior wall member of the telescoping portion of the stem, this end cap having that end or surface facing the enlarged end member and particularly the outer edge portion of said end cap contoured and adapted to provide a sealing edge or surface;

(e) a plurality of longitudinal ribs extending from the end cap to said inner stem portion adjacent the enlarged end portion, these ribs interior of the outer telescoping stem portion and providing a fluid pathway from the interior passageway to the inner surface of the wall portion of the outer stem, this inner stem portion being tubular in structure and formed with a circumferential stop means provided intermediate the enlarged end member and said ribs;

(f) an outer wall portion of the telescoping stem portions said outer wall an integral extension of the distal end of the nozzle and with this stem portion including a ring-like portion extending inwardly of the nominal inner diameter of the stem wall and with said ring-like portion having a contoured end or edge providing a fluid stop when in engagement with the end cap this stop facing toward the distal end of the nozzle and adjacent to said ring-like portion and in that inner surface toward the distal end there is formed a plurality of fluid passageways or by-passes, and

(g) cooperating stop means formed on the inner surface on the outer stem portion of the telescoping section this stop means adapted to mate with and engage stop means formed on the outer surface of the extending stem portion of the inner member, said stop means establishing and maintaining a position of said valve so as to provide a fluid stop between the outer sealing edge of the end cap of the inner stem and the mating contoured edge of the ring-like portion of the outer telescoping portion,

whereas the open end of said collapsible bag is manipulated through the collar member and then reversed over and down the outside of the collar for a short selected distance, at this condition fluid may be placed in the bag through the open end after which the terminating skirt portion of the nozzle is mounted to and on the collar member to secure and retain the bag after which the nozzle is positioned with its distal end in said body opening and then the slide valve is manipulated so the stop means is overcome and the telescoping sections are moved relative to each other to permit fluid to flow from the bag through the stem, past the ribs through the fluid by-passes in the outer telescoping portion and then to and through the discharge holes.

4,519,795

DISPOSABLE SWAB

James R. Hitchcock, Jr., and Charles J. Nevens, both of Barrington, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 216,037, Dec. 15, 1980, Pat. No. 4,360,020, which is a continuation-in-part of Ser. No. 150,011, May 15, 1980, abandoned. This application Aug. 31, 1982, Ser. No. 413,397
The portion of the term of this patent subsequent to Nov. 23, 1999, has been disclaimed.
Int. Cl.[3] A61M *35/00*
U.S. Cl. 604—289 **7 Claims**

5. A plurality of disposable swabs joined together into a strip of separable swabs, comprising

a flat, generally stiff strip,

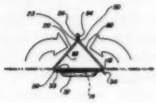
a plurality of spaced pad members centrally attached to at least one side of said strip,

means defining a first pair of fold lines extending in said strip

on opposite sides of each of said pad members by generally equal distances,

means defining lines of tearing weakness extending in said strip transversely of said fold lines for separating said strip into individual, flattened swabs, each of said swabs carrying at least one of said pad members and said associated first pair of fold lines permitting each of said swabs, when separated, to be folded rearwardly relative to said associated pad member to form a structure of generally triangular cross section which can be grasped by the fingers, the base of said triangular cross section carrying said associated pad member, and

a removable pouch sealingly enclosing each of said pad members and including



a main body portion sealed to said strip along a line which extends between said opposite pad member sides and each of said first pair of fold lines and remaining sealed to said strip along said line as said associated swab, when separated, is folded rearwardly about said pair of fold lines to form said triangular cross section structure, and

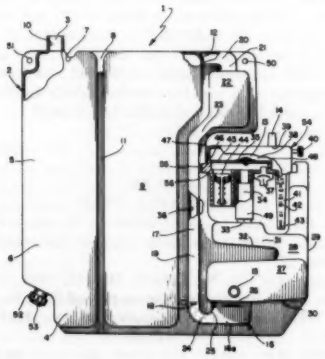
a tab portion extending outwardly from said main body portion and beyond one of said fold lines in an unsecured relationship with said strip to facilitate removal of said sealed main body portion from said associated swab after said swab, when separated, has been folded rearwardly about said one fold line.

4,519,796

THORACIC DRAINAGE DEVICE

Ronald D. Russo, 8 Candleberry Rd., Barrington, R.I. 02806

Filed Jun. 17, 1983, Ser. No. 505,237
Int. Cl.³ A61M *1/00*
U.S. Cl. 604—319 **19 Claims**



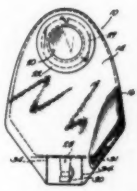
1. An apparatus for draining a patient's chest cavity comprising a body including a closed collection chamber having an inlet at the upper end thereof for connection to a patient drainage tube permitting chest cavity fluid and air to drain directly through said inlet to provide direct unobstructed flow of air and fluid into said collection chamber, an air space above the collection chamber, an outlet from the collection chamber in communication with the air space, said body further inciuding a combination negative pressure indicator and air leak detector assembly in turn including a reservoir positioned downstream of said collection chamber and having a liquid trap portion for receipt of an indicator fluid, said reservoir connected to said collection chamber by an upright column positioned intermediate said collection chamber and said reservoir and in turn connected to said outlet at the upper end thereof and to said liquid trap portion at the lower end thereof, and one-way valve seal downstream of the negative pressure indicator and air leak detector assembly acting as a seal to prevent air from entering back into the air leak detector but permitting air from the air leak detector to flow out the valve seal.

4,519,797

MEDICAL APPLIANCE POUCH WITH COVER

Lorna B. Hall, 1114 Glendale La., Madison, Wis. 53704

Filed Apr. 1, 1983, Ser. No. 481,496
Int. Cl.³ A61F *5/44*
U.S. Cl. 604—332 **2 Claims**



1. A cover for an ostomy pouch of the type comprising a waterproof pouch having an opening engageable with a patient-worn fitting and having a depending integral drain fitting at the lower part of the pouch,

said cover comprising,

front and back fabric panels having their perimeters secured together with the exception of the lower portion of each panel whereby an access opening is provided at the lower portion of the cover,

an opening in the upper portion of said back panel to provide for said opening,

said cover having an upwardly open pocket wall means for receiving a major portion of said drain fitting in its fully extended depending condition to retain the drain fitting in the pocket during normal activities of the patient,

said pocket being formed on the rear panel by turning the lower part of the rear panel back on itself to form said pocket,

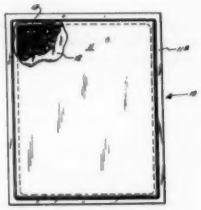
said front panel substantially overlapping the upper edge of said pocket.

4,519,798

ABSORPTIVE STRUCTURE

Richard L. Dinius, Terre Haute, Ind., assignor to Ethyl Corporation, Richmond, Va.

Filed Aug. 25, 1982, Ser. No. 411,555
Int. Cl.³ A41B *13/02*
U.S. Cl. 604—358 **12 Claims**



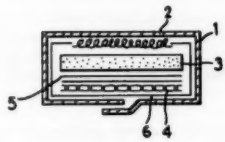
1. An absorptive structure for absorbing and containing liquid bodily discharges comprising a liquid permeable topsheet of polyolefin film, a liquid permeable carrier sheet of polyolefin film, an absorbent element, and a liquid impermeable back sheet of polyolefin film, all of said sheets of polyolefin film having the edges thereof sealed to each other without the necessity of the addition of any glue or other adhesive composition, mixture or compound, and said absorbent element sealed within said sheets of polyolefin film.

4,519,799

SANITARY NAPKIN

Akira Sakurai, Utsunomiya, and Hiroshi Mizutani, Yachiyo, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,692
Claims priority, application Japan, Feb. 19, 1982, 57-25671
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—366 **10 Claims**



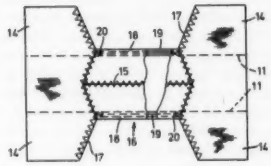
1. In a sanitary napkin which is comprised of an internal absorbent medium adapted to absorb bodily discharges and a covering fabric covering at least one surface of said internal absorbent medium and adapted to contact the wearer's skin, the improvement which comprises: said covering fabric has an integrated, two-layer structure comprising an outer layer forming the surface that is adapted to contact the wearer's skin and an inner layer disposed inside of said outer layer, said covering fabric consisting essentially of from 30 to 80% by weight of heat-fusible fibers which are fusible at a temperature of from 90° to 140° C. and correspondingly from 70 to 20% by weight of hydrophobic fibers which are not fusible at a temperature below 140° C., said covering fabric having a thickness of from 0.5 to 1.2 mm under a load of 1 g/cm^2 and a thickness of from 0.2 to 0.6 mm under a load of 5 g/cm^2, the weight ratio of said heat-fusible fibers/said hydrophobic fibers in said outer layer being in the range of 50/50 to 100/0, and the weight ratio of said heat-fusible fibers/said hydrophobic fibers in said inner layer being in the range of 20/80 to 60/40.

4,519,800

DIAPER AND METHOD OF MAKING THE SAME

Terri J. Merry, R.F.D. #1, Box 1780, Anson, Me. 04911

Filed Sep. 28, 1982, Ser. No. 425,272
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—385 A **5 Claims**



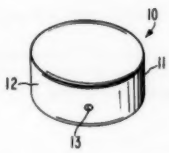
1. A reusable diaper, said diaper consisting of a blank of an absorbent fabric of predetermined length and width having central and marginal lengthwise sections, the central portion of the central section, the crotch engaging portion of the diaper, each marginal section divided to provide end portions and a central flap portion, said flap portions folded over the crotch portion and dimensioned and so disposed that they overlap in said crotch portion and are secured thereto by a line of stitching and thereby increase the moisture absorbing capacity of said crotch portion and from a leg recess and end tabs, the end tabs of each marginal section connectable about the body of a baby, and a length of elastic material extending lengthwise of each margin between the crotch portion and the overlapping flap portion with its ends anchored to the central section adjacent the ends of the central portion with the elastic material under tension thereby to yieldably shorten the margins of the central portion.

4,519,801

OSMOTIC DEVICE WITH WALL COMPRISING CELLULOSE ETHER AND PERMEABILITY ENHANCER

David Edgren, El Granada, Calif., assignor to ALZA Corporation, Palo Alto, Calif.

Filed Jul. 12, 1982, Ser. No. 397,517
Int. Cl.³ A61K *9/22*
U.S. Cl. 604—892 **9 Claims**



1. An osmotic delivery system for the controlled dispensing of a useful agent to an environment of use, wherein said system comprises:

(a) a shaped semipermeable wall permeable to the passage of fluid and substantially impermeable to the passage of an useful agent, said semipermeable wall consisting essentially of an organic solvent soluble cellulose ether and a permeability enhancer selected from the group consisting of an organic solvent soluble carboxypolymethylene, polyvinyl acetal, polyvinyl butyral, polyalkyds, polymethacrylonitrile, vinyl alcohol-vinyl acetate copolymer, and vinyl alcohol-vinyl butyral copolymer, the semipermeable wall surrounding and forming:

(b) a compartment containing a useful agent formulation that is soluble in an external fluid imbibed through the semipermeable wall into the compartment and exhibits an osmotic pressure gradient across the semipermeable wall against the external fluid; and,

(c) an osmotic passageway in the wall communicating with the compartment and the exterior of the system for dispensing the agent formulation through the osmotic passageway from the device to the environment of use.

4,519,802

USE OF 1:2 COBALT COMPLEX DYES FOR DYEING LEATHER OR FURS

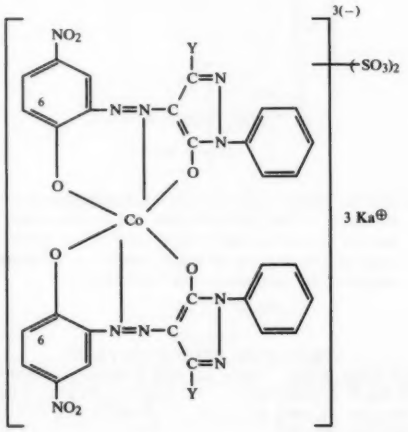
Alois Püntener, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 359,735, Mar. 19, 1982, abandoned. This application Feb. 8, 1984, Ser. No. 577,325

Int. Cl.[3] D06P *1/10, 3/30, 3/32*

U.S. Cl. 8—404 5 Claims

1. A method of dyeing leather or furs, comprising the step of applying thereto a dye composition whose active dyeing ingredient consists essentially of a dye of the formula



in which $Ka^{\oplus}$ is a cation and Y is methyl, $—CONH_2$ or —CO—NH—R, R being an alkyl group having 1–4 carbon atoms, wherein at least one of the sulfo groups is located in a diazo component.

4,519,803

PRINTING ON PRETREATED SUBSTRATES

Kenneth Clare, San Diego, Calif. and Erle Hopkinson, Horely, England, assignors to KELCO/AIL International Limited, London, England

Filed Jun. 1, 1983, Ser. No. 499,934

Int. Cl.[3] D06P *5/00*

U.S. Cl. 8—445 11 Claims

1. A process for printing substrates which comprises:

(A) applying to at least a portion of a substrate a first aqueous composition comprising (1) 0.025 to 0.275 wt. % of a soluble calcium, aluminum or chromium salt (2) 5 to 20 wt. % of the chloride, nitrate, or sulphate salts of sodium, potassium, or lithium, (3) 0.1 to 1.0 wt. % of polyhexamethylene biguanide hydrochloride, or (4) 0.35 to 1.0 wt % of citric acid so as to produce a treated substrate,

(B) then applying to at least a portion of said treated substrate a second aqueous composition comprising a dye and 0.2 to 6.0 wt. % alginate.

4,519,804

MELANGE-COLORED SHEET AND METHOD OF PRODUCING THE SAME

Hiroyasu Kato, Kyoto; Kenkichi Yagi, Otsu, and Miyoshi Okamoto, Takatsuki, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jul. 5, 1983, Ser. No. 510,928

Claims priority, application Japan, Jul. 7, 1982, 57-116869

Int. Cl.[3] D06N *3/04;* D06P *3/86, 3/87, 7/00*

U.S. Cl. 8—485 13 Claims

1. A novel melange-colored sheet having a body portion comprising (a) at least two types of fibers in a form selected from ultrafine fiber bundles, multi-core fibers and a mixture of ultrafine fiber bundles and multi-core fibers or comprising (b) multi-core fibers having at least two types of core components which are disposed on one side and the other side respectively, and a super-entangled surface portion on at least one of the surfaces of said body portion, said super-entangled surface portion having ultrafine fibers to fine bundles of ultrafine fibers branching from said ultrafine fiber bundles or said multi-core fibers of said body portion, said two types of ultrafine fiber bundles or said two types of core components of said body portion being different in color so that said super-entangled surface portion visually presents at least two colors.

8. A method of producing a novel melange-colored sheet having an inner portion comprising (a) fibers in a form selected from at least two types of ultrafine fiber bundles and multi-core fibers or comprising (b) multi-core fibers having at least two types of core components which are disposed on one side and the other side respectively, and a surface comprising super-entangled ultrafine fibers to fine bundles of ultrafine fibers branching from said fiber bundles or said multi-core fibers of the inner portion, said two types of ultrafine fiber bundles or said two types of core components being different in color so that said superentangled surface visually presents at least two colors, said method comprising the steps of:

(1) forming a fiber entangled sheet comprising multi-component fibers capable of converting into at least two types of bundles of ultrafine fibers having different dyeing properties,

(2) forming a superentangled layer of ultrafine fibers to fine bundles of ultrafine fibers on the surface of said sheet by applying to at least one side of the sheet a jet stream of high speed fluid, and

(3) dyeing the resulting surface with different types of dyestuffs.

4,519,805

VAT DYE AND SULFUR DYE COMPOSITIONS

Zdenek Koci, Binningen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

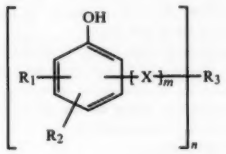
Filed Dec. 29, 1981, Ser. No. 335,428

Claims priority, application Switzerland, Dec. 30, 1980, 9644/80

Int. Cl.[3] C09B *49/00, 57/00*

U.S. Cl. 8—650 7 Claims

1. A dyestuff composition containing an effective amount of a vat dye or a sulfur dye and 0.1 to 2.0 weight %, relative to the weight of dye, of a vatting accelerator of the formula



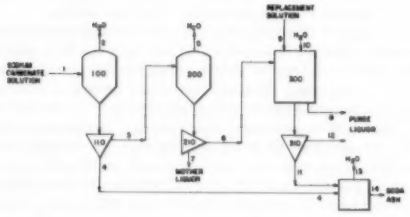
wherein R_1 and R_2 independently of one another are C_1–C_{12}-alkyl, C_3–C_{12}-alkenyl, hydroxymethyl, hydrogen, halogen, hydroxy, C_1–C_4-alkoxy, phenyl, substituted phenyl, phenethyl, or benzyloxy; m is 0 or 1; R_3 is

—S—, —S—S—, —O—, —CH=CH—, or $>CR_4R_4$, wherein each R_4 independently of the other is hydrogen or C_1–C_4-alkyl; n is a number from 2 to 4; and X is $—(CH_2)_2—COO—CH_2—$.

4,519,806
ENHANCED RECOVERY OF SODA ASH FROM AQUEOUS SODIUM CARBONATE SOLUTIONS CONTAINING NA_2SO_4- AND NACL

William C. Copenhafer, Yardley, Pa., and Michael L. Pinsky, Mount Holly, N.J., assignors to Intermountain Research & Development Corp., Green River, Wyo.

Filed Nov. 26, 1982, Ser. No. 444,640
Int. Cl.³ C01D *7/24;* C01B *31/24*
U.S. Cl. 23—302 T **13 Claims**



1. A continuous method for enhancing the recovery of dense soda ash from aqueous sodium carbonate solutions also containing sodium sulfate and sodium chloride which comprises

(i) co-crystallizing anhydrous sodium carbonate and burkeite, without precipitation of sodium chloride, by evaporative crystallization at a temperature above the anhydrous-monohydrate transition temperature, of an aqueous sodium carbonate feed solution also containing sodium sulfate and sodium chloride, such solution being unsaturated with respect to sodium chloride and having an $NaCl:Na_2SO_4$ weight ratio less than 37:1 and an $NaCl:Na_2CO_3$ weight ratio less than 2.2:1;

(ii) separating the crystallized solids from the crystallization slurry;

(iii) introducing the crystallized solids into a well-mixed aqueous medium, maintained at a temperature below the anhydrous-monohydrate transition temperature, that is substantially saturated with respect to sodium carbonate monohydrate, unsaturated with respect to burkeite, and contains less than that amount of sodium chloride which would result in crystallization of anhydrous sodium carbonate, so as to effect dissolution of the burkeite and reversion of the anhydrous sodium carbonate to crystalline sodium carbonate monohydrate;

(iv) separating the sodium carbonate monohydrate solids in the aqueous medium from its mother liquor to thereby recover a relatively pure soda ash; and

(v) purging mother liquor from the aqueous medium and replacing such purged liquor with water or other aqueous solution containing sodium carbonate in amounts sufficient to maintain the aqueous phase of the aqueous medium at a relatively constant composition.

4,519,807
CARBONACEOUS SOLID FUEL

Atsushi Nishino, Neyagawa; Kunio Kimura; Kazunori Sonetaka, both of Hirakata, and Yukiyoshi Iketani, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 359,082, Mar. 17, 1982, abandoned. This application Dec. 28, 1983, Ser. No. 565,525
Int. Cl.³ C10L *5/02, 9/02*
U.S. Cl. 44—15 R **4 Claims**

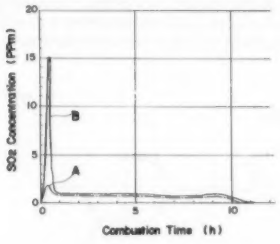
1. A molded solid fuel which comprises:

a carbonaceous fuel material;

at least one desulfurizing agent selected from the group consisting of $Ca(OH)_2$, $CaCO_3$ and dolomite, the amount of said desulfurizing agent being within the range of 3 to 20 parts by weight relative to the 100 parts by weight of the carbonaceous fuel material;

K_2CO_3 in an amount within the range of 1 to 20 parts by weight relative to the total amount of the carbonaceous fuel material,

wherein the ratio of parts by weight of desulfurizing agent to K_2CO_3 is within the range of 0.2 to 10; and



at least one member selected from the transition metal oxides consisting of manganese dioxide and copper oxide, the amount of said transition metal oxide being within the range of 1 to 10 parts by weight relative to 100 parts by weight of the carbonaceous fuel material.

4,519,808
STRAW FUEL BRIQUETTE PRESS

Borge Stisen, Kirsebærhaven 72, 3480 Fredensborg, Denmark

PCT No. PCT/DK82/00004, § 371 Date Sep. 29, 1982, § 102(e) Date Sep. 29, 1982, PCT Pub. No. WO82/02995, PCT Pub. Date Sep. 16, 1982
PCT Filed Jan. 21, 1982, Ser. No. 433,210
Claims priority, application Denmark, Mar. 10, 1981, 1072/81
Int. Cl.³ C10L *5/44;* A01F *15/04;* B30B *11/16*
U.S. Cl. 44—10 A **5 Claims**

1. A process of producing in the field straw briquettes from straw fibers, comprising the steps of: in compaction means forming a sausage of straw fibers, and subjecting the straw fibers in said compaction means during conveyance therethrough to compaction impacts of a relatively high frequency at high pressure in a symmetrical manner on both longitudinal sides of said sausage of straw fibers.

2. A transportable apparatus for making straw briquettes comprising: briquette pressing means shaped as two rotatable blocks arranged side by side, fingers associated with said rotatable blocks, and a high speed mechanism for imparting synchronized, oppositely directed rotary oscillations to said fingers, the arrangement being such that said high speed mechanism reaches a dead center position in the most advanced end position of the fingers in engagement with straw fibers.

4,519,809
METHOD FOR REDUCING WATER SENSITIVITY OF ETHER CONTAINING GASOLINE COMPOSITIONS

Albert M. Hochhauser, Edison, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

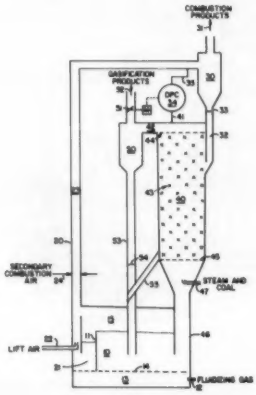
Filed Apr. 23, 1984, Ser. No. 603,077
Int. Cl.³ C10L *1/02*
U.S. Cl. 44—53 **10 Claims**

1. A method for reducing the water sensitivity of an ether containing gasoline composition which comprises mixing an alkyl ether component having alkyl groups of 1 to 7 carbon atoms after it is prepared and while it is essentially water free with at least 40% by volume of a branched chain paraffin component having up to 11 carbon atoms and derived from the alkylation of an isoparaffin and an olefin before it is added to the gasoline.

4,519,810
CIRCULATION LOOP FOR CARRYING OUT TWO-STAGE REACTIONS

John C. Haas, El Sobrante, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 17, 1983, Ser. No. 505,529
Int. Cl.³ C10J *3/54*
U.S. Cl. 48—202 12 Claims



1. A method of controlling the solids circulation between a downflow coal gasification reactor and an entrained bed combustion reactor comprising:

(a) transferring at least some of said solids from said downflow reactor to a crossflow fluidized bed through at least one seal leg, wherein said crossflow fluidized bed has a baffle separating the crossflow fluidized bed into two zones, wherein said two zones comprise a first zone and a second zone, and wherein said solids are transferred from said downflow reactor to the first zone of said crossflow fluidized bed;

(b) transferring said solids over said baffle from said first zone to said second zone;

(c) transferring said solids from said second zone of said crossflow fluidized bed to said entrained bed reactor; and

(d) transferring said solids from said entrained bed reactor to said downflow reactor through a second seal leg; controlling the solids circulation rate by adjusting the rate of fluidizing gas entering said crossflow fluidized bed.

4,519,811
CALCINED SERPENTINE USEFUL AS SANDBLASTING AGENT

Jean M. Lalancette; Jean P. Chevalier-Bultel, and Normand Labonte, all of Sherbrooke, Canada, assignors to Societe Nationale de l'Amiante, Quebec, Canada

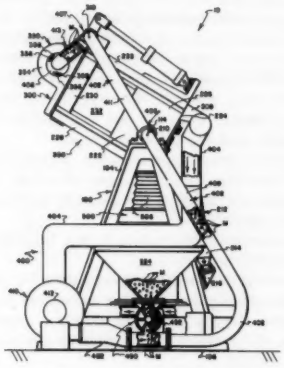
Filed May 24, 1984, Ser. No. 613,403
Int. Cl.³ C09C *1/68*
U.S. Cl. 51—309 1 Claim

1. A sintered angular shape granular sandblasting material obtained by the calcination of asbestos tailings at a temperature of from 1300° C. to 1450° C., said asbestos tailings being characterized by having a $MgO:SiO_2$ ratio lower than 1.0, the granular sandblasting material being characterized by a cold compression mechanical strength of from 10 to 160 MPa, by a granulometry of −40 to +150 mesh (Tyler), and by being substantially free of dust.

4,519,812
CRYOGEN SHOT BLAST DEFLASHING SYSTEM WITH JOINTED SUPPLY CONDUIT

John J. Brull, Chagrin Falls, and Michael T. Carnahan, Bedford, both of Ohio, assignors to AGA AB, Cleveland, Ohio

Filed Oct. 28, 1983, Ser. No. 546,429
Int. Cl.³ E05D *13/02*
U.S. Cl. 51—422 15 Claims



1. A cryogen shot blast deflashing apparatus, comprising:

a. receptacle means defining a treatment chamber for receiving workpieces to be deflashed, frame means for supporting the receptacle means for movement relative to the frame means, and drive means for moving the receptacle means relative to the frame means to impart movement to workpieces contained within the treatment chamber;

b. first positioning means for moving the receptacle means about a first axis relative to the frame means;

c. throwing wheel means for receiving a supply of particulate media and a flow of cryogen gas, for propelling media into the treatment chamber to impact workpieces within the treatment chamber;

d. cryogen supply and recirculation means for supplying cryogen gas to the treatment chamber, and for ducting cryogen along a flow path for withdrawal from the treatment chamber and for redelivery to the throwing wheel;

e. the cryogen recirculation means including conduit means defining at least a portion of the flow path and having first conduit portions which are interconnected at a location along the first axis by first joint means for permitting relative movement of the first portions about the first axis to enable the supply conduit means to accommodate movement of the receptacle means relative to the frame means.

4,519,813
PROCESS FOR EXTRACTION OF HIGHLY PURIFIED OXYGEN

Zenzi Hagiwara; Tatuo Yamamoto, both of Kusatsu, and Hiroshi Kurozumi, Sakai, all of Japan, assignors to Osaka Oxygen Industries Ltd., Osaka, Japan

Continuation of Ser. No. 884,651, Oct. 25, 1977, abandoned.
This application Dec. 26, 1979, Ser. No. 106,474
Claims priority, application Japan, Feb. 10, 1977, 52-13672
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—26 8 Claims

1. A process for separating oxygen of more than 90% purity from a raw material gas containing oxygen and nitrogen as main components, which comprises providing at least two adsorption zones, each of said at least two zones having an inlet end and a discharge end and containing therein a bed of at least one adsorbing agent, the at least one agent having sieving

action which is capable of selectively adsorbing nitrogen from said raw material gas, characterized by the following in the following steps cyclical sequence:

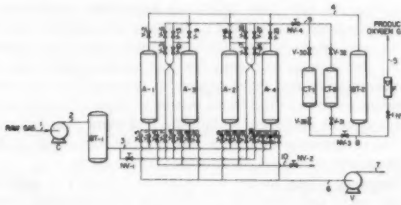
(i) contacting said raw material gas with said bed by passing said raw material gas through the one of said adsorption zones, in which a regenerating step was previously completed, to adsorb most of the nitrogen and part of the oxygen in the bed, and to discharge oxygen of more than 90%, purity from said zone discharge end;

(ii) connecting said one adsorption zone, in which the adsorption step was previously completed, to the other of said adsorption zones, in which a pressurizing step by product oxygen gas as mentioned below was previously completed, to carry out pressure equalization between said two zones, whereby the oxygen-rich gas is cocurrently discharged from the said one adsorption zone to depressurize said one adsorption zone;

(iii) countercurrently depressurizing to one atmosphere pressure said one adsorption zone, in which the step of discharging gas through the pressure equalization was previously completed;

(iv) countercurrently evacuating to less than 200 torr said one adsorption zone;

(v) pressurizing said one adsorption zone by countercurrently introducing into said one adsorption zone part of the product oxygen gas in the direction counter to the direction of the stream of raw material gas while closing one end thereof;



(vi) pressurizing said one adsorption zone, in which the pressurizing step by the product oxygen gas was previously completed, by cocurrently introducing into said one adsorption zone the gas discharged from said other adsorption zone in step (ii) of the cycle of said other adsorption zone; and

(vii) pressurizing said one adsorption zone, in which the pressurizing step through the pressure equalization was previously completed, by introducing a raw material gas into said one adsorption zone in the same direction as the direction of the stream of raw material gas in adsorption step (i) while closing one end of said one adsorption zone;

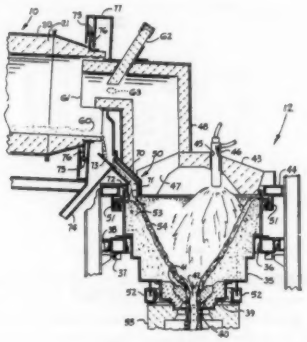
periodically switching the flow of gases between said adsorption zones so that the adsorption step takes place in the zone in which the regenerating step was previously completed, the step of discharging gas through the pressure equalization takes place in the zone in which the adsorption step was previously completed, the depressurizing step takes place in the zone in which the step of discharging gas was previously completed, the evacuating step takes place in the zone in which the depressurizing step was previously completed, the pressurizing step by product oxygen gas takes place in the zone in which the evacuating step was previously completed, the pressurizing step through the pressure equalization takes place in the zone in which the pressurizing step by product oxygen gas was previously completed, and the pressurizing step by a raw material gas takes place in the zone in which the pressurizing step through the pressure equalization was previously completed.

4,519,814

TWO STAGE BATCH LIQUEFACTION PROCESS AND APPARATUS

Henry M. Demarest, Jr., Natrona Heights, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jul. 25, 1983, Ser. No. 516,817
Int. Cl.³ C03B *1/00, 3/00*
U.S. Cl. 65—27 **45 Claims**



1. A method of liquefying pulverulent batch materials comprising: passing pulverulent batch materials into a preheating vessel, in the preheating vessel exposing the batch materials to hot gas while agitating the batch materials so as to heat the batch materials, passing the heated batch materials from the preheating vessel into a liquefying vessel and depositing the heated, pulverulent batch materials onto a stable sloping layer of batch encircling a cavity within the liquefying vessel, providing combustion heat within the cavity to partially liquefy the deposited pulverulent batch materials and to permit the partially liquefied batch to flow over the stable batch layer to an exit opening from the liquefying vessel, balancing the rate of heating in the liquefying vessel and the rate at which the batch materials are fed into the liquefying vessel so as to maintain the stable batch layer substantially constant, and passing products of combustion from the liquefying vessel to the preheating vessel.

42. Apparatus for liquefying pulverulent batch materials comprising: rotary kiln means comprising an elongated inclined cylindrical vessel adapted for rotation about its cylindrical axis angled slightly from horizontal, means for feeding pulverulent batch materials to a first end of the rotary kiln, batch liquefying means at the opposite end of the rotary kiln, the liquefying means including a cavity extending along a substantially vertical axis to a bottom outlet opening and encircled by a lining of batch material having steeply sloped surface portions facing the cavity, means to heat the cavity, and an upper inlet opening for depositing batch from the rotary kiln onto the lining.

4,519,815

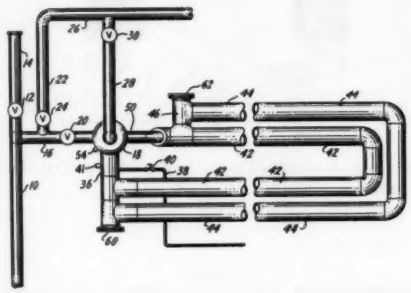
SLUG-CATCHING METHOD AND APPARATUS

Ronald L. Buls, Spring, and James P. Gilcrease, Katy, both of Tex., assignors to Texas Eastern Engineering Ltd., Houston, Tex.

Filed Dec. 15, 1983, Ser. No. 561,694
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—46 **12 Claims**

1. A method for separating and recovering liquid components from the effluent from a natural gas pipeline containing both gaseous and liquid components under the conditions existing in the pipeline, which comprises (a) introducing the effluent into an intermediate portion of a vertical separation zone wherein the gaseous components of the effluent are disen-

gaged from the liquid components and move upwar in the zone and the liquid components in the fluid stream, disengaged from the gaseous components, moved downwardly toward the bottom of the separation zone; (b) withdrawing the separated gaseous components from the upper portion of the separation zone and reintroducing them into the pipeline at a point downstream of the point of withdrawal; (c) gradually withdrawing on a substantially continuous basis a stream of the liquid components from a bottom portion of the separation zone for delivery to a point outside the separation zone; (d) diverting liquid components in excess of the quantity withdrawn in step



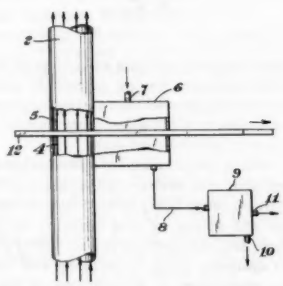
(c) into a substantially U-shaped accumulation zone extending entirely substantially horizontally from the bottom portion of the separation zone and having a continuous gradually rising slope extending from substantially the bottom of the separation zone to a point in the upper portion of the separation zone lying above the point of introduction of the fluid stream and below the point of withdrawal of the gaseous components, whereby the liquid components lie at or above the level at which they flow into the accumulation zone; and (e) withdrawing gas displaced by and disengaged from the liquid in the accumulation zone into the upper portion of the separation zone for introduction into the pipeline.

4,519,816

METHOD FOR THE RECOVERY OF SOLVENT VAPORS

Donald H. Clarke, Essexville, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Oct. 1, 1980, Ser. No. 193,340
Int. Cl.³ B01D *53/14*
U.S. Cl. 55—59 **4 Claims**



1. A method for recovering vapor of a volatile, organic liquid in a liquid form from a gas containing the organic vapor, said method comprising the steps of

(a) contacting the gas containing the organic vapor with a gas permeable polyurethane foam at conditions sufficient to reduce the concentration of the vapor in the gas;

(b) desorbing the organic vapor from the foam; and

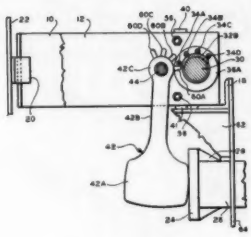
(c) condensing the desorbed vapor.

4,519,817

PRECIPITATOR RAPPER

Robert E. Gibbons, Rockaway, N.J., assignor to Belco Pollution Control Corporation, Parsippany, N.J.

Filed Apr. 22, 1983, Ser. No. 488,507
Int. Cl.³ B03C *3/76*
U.S. Cl. 55—112 **9 Claims**



1. A rapper for striking a target in a precipitator, comprising:

a frame;

a hammer having a hub pivotally attached to said frame; and

a drive sprocket means rotatably mounted in said frame and having a driving plurality of spaced teeth, said driving plurality of teeth comprising a plurality of peripherally spaced rods, each having clearance along at least a portion of its radially inward side, said driving plurality of teeth being distributed on said sprocket means along a given peripheral sector, the given peripheral sector being less than the entire periphery of said sprocket means;

a driven plurality of spaced teeth mounted on and radially extending from said hub, said driven plurality of spaced teeth being distributed along a fraction of the circumference of said hub and being sized to be engaged by said drive sprocket means and mesh with the driving plurality of teeth on said sprocket means, said rods of said sprocket means being arranged to mesh with said driven plurality of teeth transversely, all of said teeth of said sprocket means being distributed to mesh with an equivalent number of the teeth of said hub and then release said hub, more than one of said teeth of said sprocket means meshing with said hub for each release of said hammer.

9. A rapper for striking a target in a precipitator, comprising:

a frame;

a hammer having a hub pivotally attached to said frame; and

a drive sprocket means rotatably mounted in said frame and having a driving plurality of spaced teeth, said driving plurality of spaced teeth comprising a pair of circumferential ridges atop said sprocket means and a plurality of peripherally spaced, axially disposed rods mounted across said ridges, said driving plurality of spaced teeth being distributed on said sprocket means along a given peripheral sector, the given peripheral sector being less than the entire periphery of said sprocket means, all of said teeth of said sprocket means being distributed to mesh with an equivalent number of teeth on said hub and then release said hub, more than one of said teeth of said sprocket means meshing with said teeth on said hub for each release of said hammer.

4,519,818

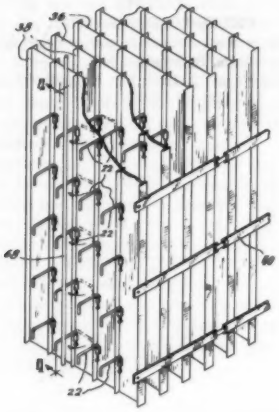
ELECTROSTATIC PRECIPITATOR CONSTRUCTION HAVING MOVABLE SPACERS

John A. Jonelis, 304 Lancaster Dr., Crystal Lake, Ill. 60014

Continuation-in-part of Ser. No. 446,775, Dec. 3, 1982, Pat. No. 4,478,614. This application Aug. 3, 1984, Ser. No. 637,431

Int. Cl.³ B03C *3/08, 3/47*

U.S. Cl. 55—130 **20 Claims**



1. In an electrostatic precipitator for collecting solid particles carried by a flue gas from a source of combustion, said precipitator including; a plurality of spaced parallel plates for collecting solid particles by electrostatic attraction of solid particles to the plates, a second plurality of elongated electrodes mounted between adjacent plates, the improvement comprising; a third plurality of spacers pivotally mounted on the plates, each of said spacers being selectively positionable substantially parallel to its respective plate, each of said spacers being selectively positionable to an attitude substantially perpendicular to its respective plate, each of said spacers extending from its respective plate to the adjacent plate to maintain adjacent surfaces of adjacent plates equidistantly spaced from one another, and a lock cooperative with each spacer, each lock being positioned on the respective plate upon which each spacer is pivotally mounted for holding the respective spacer in an attitude substantially perpendicular to the respective plate.

4,519,819

PRECOALESCER UNIT

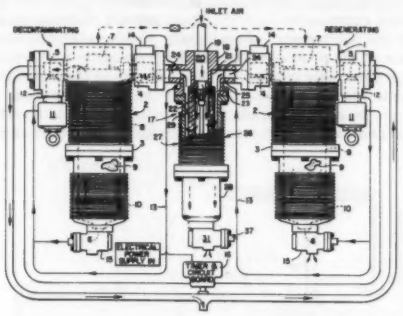
Virgil L. Frantz, Salem, Va., assignor to Roanoke College, Salem, Va.

Filed Aug. 23, 1984, Ser. No. 643,414

Int. Cl.³ B01D *53/04*

U.S. Cl. 55—162 **6 Claims**

1. In apparatus for decontaminating compressed gas, the combination with twin towers each having a housing containing a desiccant and having inlet, outlet and drain valves and a solenoid valve connected by an actuating gas line to the inlet and drain valves, the towers under timer control of the solenoid valves alternately receiving gas from a source of contaminated gas and individually cycling between decontaminating and regenerating cycles, of a precoalescer unit comprising a casing containing a tubular coalescer interposed in the path of flow of gas from said source to inlet ports of said towers, and valve means on and in said casing and responsive to cycling of the towers for opening for an interval during each decontaminating and purge cycle of a tower for purging said unit of



contaminants accumulated in said casing inside and outside of said coalescer.

4,519,820

FITTER APPARATUS FOR PURIFYING EXHAUST GASES

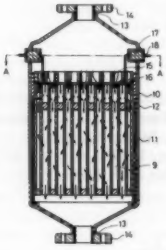
Kazuo Oyobe, Ohbu; Etsuji Nomura, Ichinomiya; Kazuma Matsui, Toyohashi; Masanori Fukutani, Nagoya; Kazuyuki Ito, Nishio; Naoto Miwa, Tsushima, and Keiji Ito, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 3, 1983, Ser. No. 520,126

Claims priority, application Japan, Aug. 5, 1982, 57-137040

Int. Cl.³ B01D *39/20;* **F01N** *3/02, 3/16*

U.S. Cl. 55—284 **15 Claims**



1. Filter apparatus for purifying exhaust gases comprising:

a honeycomb structure having permeable partition walls forming generally parallel inlet and outlet passages for the gases, particulates in the gases being trapped on some of the surfaces of said inlet passages;

upstream packing plugs located in upstream portions of said outlet passages so as to close said passages, at least some of said upstream plugs being spaced downstream from the upstream end surface of said structure so as to define spaces between said upstream end surface of said structure and said upstream plugs for trapping and collecting exhaust gas particulates on at least some of the surfaces of said spaces;

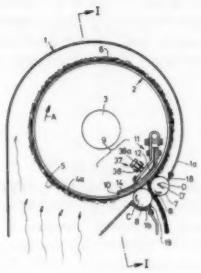
downstream packing plugs located in the downstream ends of said inlet passages so as to close said inlet passages; and

at least one heater located at the upstream end of said honeycomb structure to heat and ignite the particulates trapped and collected in the upstream portions of said structure including the particulates trapped on said spaced surfaces.

4,519,821
MEANS FOR REMOVING A LAYER OF MATTED FIBERS FROM A FILTER DRUM

Kurt Weber, Elgg; Giancarlo Mondini, Winterthur, and Gerhard Mandl, Bruetten, all of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Oct. 18, 1982, Ser. No. 434,747
Claims priority, application Switzerland, Oct. 21, 1981, 6712/81
Int. Cl.³ B01D *46/04, 46/26*
U.S. Cl. 55—290 10 Claims



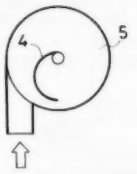
1. In combination,
a filter housing having an opening and an inlet for entry of fiber laden air;
a cylindrical filter drum rotatably mounted in said housing for receiving a layer of matted fibers on an outer perforated surface thereof;
means for generating a suction force within said drum;
means for stripping the layer of fibers from said filter drum at said opening, said means including a rotatable compressing roll and a rotatable take-off roll in said opening and forming a nip for removal of the matted fiber layer, said compressing roll being in tangential contact at a first point with said drum with a first plane extending through said point and an axis of rotation of said compressing roll and being in tangential contact at a second point with said take-off roll with a second plane extending through said second point and said axis of rotation to define a given angle with said first plane and a flexible sealing membrane engaging an internal wall of said filter drum to sealingly block off said wall at said opening from the interior of said drum;
means for pressing said sealing membrane against said internal wall of said drum entirely along the surface of contact of said membrane with said drum; and
said compressing roll being pivotally mounted to move in a plane corresponding to a bisector of said angle to move from said take-off roll and said drum.

4,519,822
CYCLONE

Hirofumi Hatano, and Yoji Hirota, both of Kitakyushu, Japan, assignors to Mitsubishi Mining and Cement Co. and Mitsubishi Jukogyo Kabushiki Kaisha, both of, Japan

Continuation of Ser. No. 335,674, Dec. 30, 1981, abandoned.
This application Jul. 12, 1983, Ser. No. 513,073
Claims priority, application Japan, Jan. 21, 1981, 56-2840
Int. Cl.³ B01D *45/12*
U.S. Cl. 55—459 R 1 Claim

1. A cyclone device comprising:
a cylindrical tubular body having a vertical central axis and a ceiling for defining a space, said sealing having a circular opening with a center at an eccentric location with respect to said central axis;
a tapered body portion connected to a lower edge of said cylindical tubular body, tapering inwardly and downwardly and having a lower central solid particle outlet opening;
a fluid inlet connected tangentially to said cylindrical tubular body for supplying fluid with particles to be separated, to said space in a tangential direction around said central axis, said fluid inlet connected to said body at a location to cause the fluid to rotate in said body around said central axis in a rotation direction;
a cylindrical fluid discharge pipe connected to said ceiling around said circular opening therein, said pipe opening into said space and terminating at said ceiling and before said pipe extends into space, no part of said fluid discharge pipe extending into said space; and
a vertical guide plate having a semi-circular horizontal cross-sectional shape, extending downwardly from said ceiling only part of the vertical distance of said cylindrical tubular body, said semi-circular guide plate having opposite vertical edges and extending from a part of said opening in said ceiling downwardly into said cyindrical tubular body, said semi-circular guide plate plate being the only structure extending downwardly into said space and being



asymmetrically positioned with respect to said semi-circular guide plate being the only structure extending downwardly into said space and being asymmetrically positioned with respect to said central axis, a radially inner one of said vertical edges being in the vicinity of said central axis and a radially outer one of said edges being near but spaced away from an inner surface of said cylindrical tubular body, said semi-circular guide plate being disposed approximately three-quarters of the way round said rotation direction and being convex in a direction facing said location where said fluid inlet is connected to said body, said semi-circular guide plate being concave in a direction facing oncoming fluid moving in the rotation direction;
whereby fluid entering through said fluid inlet and moving around said space defined by said cylindrical tubular body engages against said semi-circular guide plate which reduces an amount of rotation of fluid in said tubular body and advances a separation of particles from the fluid, the fluid moving upwardly through said discharge pipe and the particles moving downwardly through said solid particle opening.

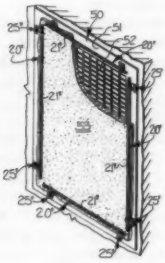
4,519,823
AIR FILTER ASSEMBLY HAVING IMPROVED CLAMPING MEANS FOR FILTER MEDIA

William L. Kinney, Jr., and Richard E. Evans, Jr., both of Charlotte, N.C., assignors to United Air Filter Company, Charlotte, N.C.

Filed Mar. 16, 1983, Ser. No. 475,764
Int. Cl.³ B01D *46/00*
U.S. Cl. 55—493 9 Claims

1. A filter assembly comprising a supporting frame, a foraminous filter body support carried by said frame, a filter body formed of resilient filter media overlying said support, and clamping means mounted on said supporting frame and resiliently engaging marginal areas of said filter body for maintaining the filter body in overlying relation on said support, said clamping means comprising elongate members extending substantially parallel to marginal edge portions of the filter body

along a plurality of sides of the filter body and engaging marginal facial portions of the filter media forming the filter body, and clips supportingly carrying said elongate members along the marginal areas of said filter body, each clip having an arm connected to said elongate member for carrying the same, said arms being pivotally movable to first and second positions and



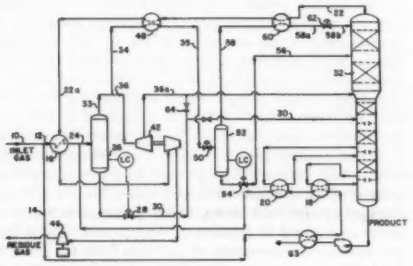
wherein in the first position said elongate members carried by the respective arms are in biased spring clamping engagement with said filter body and wherein in the second position said elongate members are away from and out of clamping engagement with said filter body to facilitate replacement of the filter body.

4,519,824

HYDROCARBON GAS SEPARATION

Robert R. Huebel, Houston, Tex., assignor to The Randall Corporation, Houston, Tex.

Filed Nov. 7, 1983, Ser. No. 549,044
Int. Cl.[3] F25J *3/02*
U.S. Cl. 62—26 **8 Claims**



1. In a process for the separation of a feed gas containing methane and ethane into a volatile residue gas containing a major portion of said methane and a relatively less volatile fraction containing a major portion of said ethane wherein methane and ethane together comprise a major portion of said feed gas and wherein said feed gas is cooled under relatively high pressure and then expanded to a relatively low pressure whereby it is further cooled and said further cooled feed stream is fractionated at said relatively low pressure in a fractionation column wherein the overhead temperature is maintained at a temperature whereby the major portion of said ethane is recovered in said less volatile fraction at the bottom of said fractionation column; the improvement comprising:

(a) dividing said feed gas into first and second cooled gaseous streams,

(b) expanding said first gaseous stream to said relatively low pressure,

(c) further cooling said second gaseous stream at said relatively high pressure and then expanding to an intermediate pressure such that a portion of said second gaseous stream is condensed,

(d) separating said condensed portion from the remaining gaseous portion of said second gaseous stream,

(e) expanding said separated condensed portion of said second gaseous steam to said relatively low pressure,

(f) further cooling said separated remaining gaseous portion of said second gaseous stream and then expanding to said relatively low pressure, and

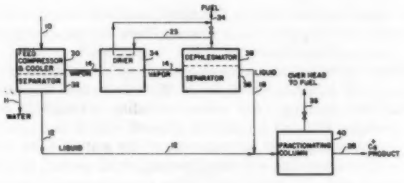
(g) feeding said expanded first gaseous stream (b), said expanded condensed portion of said second gaseous stream (e) and said expanded remaining gaseous portion of said second gaseous stream (f) to said fractionation column at first, second and third feed points, respectively, said third feed point being the top column feed and said second and third feed point being at lower column positions.

4,519,825

PROCESS FOR RECOVERING C_4+ HYDROCARBONS USING A DEPHLEGMATOR

Dennis P. Bernhard, Allentown; Howard C. Rowles, Center Valley, and Robert L. Teichman, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Apr. 25, 1983, Ser. No. 488,328
Int. Cl.[3] F25J *3/02*
U.S. Cl. 62—28 **8 Claims**



1. A process for separating C_4 and heavier hydrocarbons in high recovery and a purity of at least 60 mole %, from a feed gas comprising about 0–5 mole % C_5 and heavier hydrocarbons, 1–10% C_4 hydrocarbons, 0–10% C_3 hydrocarbons, 0–10% C_2 hydrocarbons, and the balance CH_4 and light inerts, which comprises:

(a) pressurizing the feed gas to a level from 10 to 40 atmospheres if not at said level;

(b) establishing and maintaining said feed gas at a temperature of from 2° to 38° C.;

(c) passing said feed gas, prior to fractionation, to a dephlegmator, thereby cooling said feed gas to a preselected overhead temperature, within the range from −52° to −76° C., for forming a liquid condensate containing C_4+ hydrocarbons of a purity of at least 60 mole % and an overhead vapor fraction;

(d) withdrawing said liquid condensate from the dephlegmator;

(e) withdrawing said overhead vapor fraction from said dephlegmator and warming by indirect heat exchange against the feed in said dephlegmator;

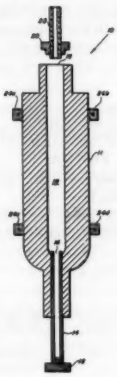
(f) work expanding the resulting warmed overhead vapor fraction in an expander to a pressure sufficient to generate a cold fraction having the required refrigeration value and having a temperature from about 2° to 15° C. below the preselected overhead temperature in said dephlegmator; and

(g) withdrawing said cold fraction from the expander and again warming by indirect heat exchange against the feed in said dephlegmator.

4,519,826
OPTICAL FIBERS HAVING A FLUORIDE GLASS CLADDING AND METHOD OF MAKING

Danh C. Tran, Rockville, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 14, 1983, Ser. No. 484,764
Int. Cl.³ C03B 37/075, 19/04
U.S. Cl. 65—3.11 9 Claims

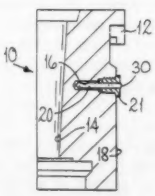


1. A method of forming an optical fiber having a core and fluoride glass cladding comprising the steps of:
axially rotating a vertically-disposed, thermally-conductive tubular mold containing a fluoride glass cladding melt until said cladding melt has coated essentially the entire bore surface of said mold;
rapidly tilting the mold, while continuing to axially rotate said mold, until said mold becomes horizontally disposed;
continuing to axially rotate said mold at least until said cladding melt has evenly coated the bore surface of said mold;
rapidly cooling said cladding melt until its temperature is about equal to that of said mold, thus forming a cladding tube;
introducing a glass core melt suitable for producing optical fibers into said cladding tube to form a preform;
removing said preform from said mold; and
drawing said preform to form an optical fiber.

4,519,827
CONTROLLING THE TEMPERATURE OF A GLASS MOULD

Stanley P. Jones, Tickhill, England, assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Feb. 27, 1984, Ser. No. 584,026
Int. Cl.³ C03B 9/38
U.S. Cl. 65—29 8 Claims

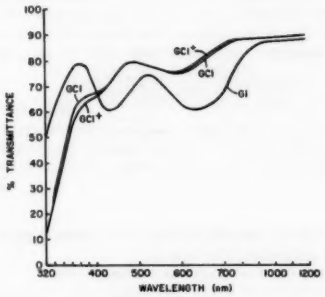


1. A method of controlling the temperature of a mould during the manufacture of moulded articles wherein a portion of the mould is moved between a mould open position thereof and a mould closed position thereof, wherein the method comprises forming a passage in the mould portion which extends from an external surface of the portion to a position adjacent a mould cavity defining surface of the portion, inserting an infra-red radiation transmitting device into the passage so that the device can transmit infra-red radiation along the passage to the external surface of the portion, mounting an infra-red radiation detecting device so that, when the mould portion is stationary, it can receive infra-red radiation transmitted to the external surface of the portion by the transmitting device and operating mould heating or mould cooling means in accordance with whether the radiation detected by the detecting device indicates that the mould temperature is too high or too low.

4,519,828
TRANSPARENT GLASS-CERAMICS CONTAINING MULLITE

George H. Beall, Big Flats; John F. MacDowell, and Mark P. Taylor, both of Painted Post, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Division of Ser. No. 395,617, Jul. 6, 1982, Pat. No. 4,396,720.
This application Mar. 28, 1983, Ser. No. 479,681
Int. Cl.³ C03C 3/22
U.S. Cl. 65—33 8 Claims



1. A method for making a substantially transparent glass-ceramic article containing mullite as the predominant crystal phase comprising the steps of:
(a) melting a batch for a glass capable of being melted at temperatures no higher than 1650° C., capable of being crystallized in situ at high viscosities, i.e., about 10^9–10^{12} poises, and consisting essentially, expressed in terms of weight percent on the oxide basis, of 40–60% SiO_2, 12–30% B_2O_3, 17.5–27.5% Al_2O_3, and 3–13% Na_2O and/or K_2O, the glass having a mole ratio Al_2O_3:R_2O > 1.75.
(b) cooling said melt to a temperature at least below the transformation range of the glass and simultaneously shaping a glass article of a desired geometry therefrom;
(c) exposing said glass article to a temperature between about 700°–950° C. for a period of time sufficient to cause the generation of crystallization in situ at a viscosity of about 10^9–10^{12} poises and to provide a crystallized glass article which is substantially transparent and contains mullite as the predominant crystalline phase; and then
(d) cooling said crystallized article to room temperature.

5. A method for making a substantially transparent glass-ceramic article containing mullite as the predominant crystal phase comprising the steps of:
(a) melting a batch for a glass capable of being melted at temperatures no higher than 1650° C., capable of being crystallized in situ at high viscosities, i.e., about 10^9–10^{12} poises, and consisting essentially, expressed in terms of weight percent on the oxide basis, of 15–45% $SiO_2$2-

0–30% B_2O_3, 20–40% Al_2O_3, and 5–30% RO, wherein RO consists of at least one member of the group in the indicated proportions of 0–15% MgO, 0–20% CaO, 0–30% SrO, 0–30% BaO, the glass having a mole ratio $Al_2O_3:R_2O > 1.75$;

(b) cooling said melt to a temperature at least below the transformation range of the glass and simultaneously shaping a glass article of a desired geometry therefrom;

(c) exposing said glass article to a temperature between about 700°–950° C. for a period of time sufficient to cause the generation of crystallization in situ at a viscosity of about 10^9–10^{12} poises and to provide a crystallized glass article which is substantially transparent and contains mullite as the predominant crystalline phase; and

(d) cooling said crystallized article to room temperature.

4,519,829

METHOD OF AND APPARATUS FOR QUENCH-TEMPERING SHAPED GLASS

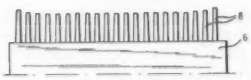
Horst Spittka; Rudolf Eckardt, and Cristoph Neuendorf, all of Wesel, Fed. Rep. of Germany, assignors to Flachglas Aktiengesellschaft, Fürth, Fed. Rep. of Germany

Filed Oct. 13, 1983, Ser. No. 541,683

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1982, 3238043

Int. Cl.³ C03B 27/04

U.S. Cl. 65—114 **5 Claims**



1. A method of quench-tempering a hot shaped glass sheet, the method comprising the steps of:

transporting the sheet into a quenching station;

supporting the sheet in the quenching station underneath a downwardly directed upper nozzle array and above an upwardly directed lower nozzle array by engagement of only a portion of the lower surface of the sheet, the portion engaged for support being interrupted by a generally uniformly distributed array of unsupported regions;

directing an air stream from the lower nozzle array up toward the lower surface of the glass sheet while directing an opposite air stream down from the upper nozzle array toward the upper surface of the sheet;

shielding generally all of the lower surface of the sheet except the unsupported regions from the air stream of the lower nozzle array, whereby a prestress field is formed in the sheet which corresponds to the distribution of the unsupported regions; and

thereafter transporting the sheet out of the station, the sheet being held during one of the transporting steps by clipping the sheet outer periphery up against a holding ring having the same shape as the outer periphery of the sheet.

4. An apparatus for quench-tempering a hot shaped glass sheet having an outer periphery, the apparatus comprising:

a downwardly directed upper nozzle array;

an upwardly directed lower nozzle array below the upper array and forming a quenching station therewith;

a rigid plate having the same shape as the sheet but formed with an array of throughgoing holes and having an outer periphery shaped like the outer periphery of the sheet;

means for supporting the sheet on the plate with the lower face of the sheet being exposed to the lower nozzle array only at the holes in the plate;

means for directing an air stream from the lower nozzle array up toward the lower surface of the glass sheet, whereby a prestress field is formed in the sheet which corresponds to the distribution of the holes in the plate;

loading means for transporting the sheet into the station prior to quenching therein while supported on the plate;

unloading means for transporting the sheet out of the station after quenching therein while still supported on the plate; and

one of the means for transporting including an annular support ring engageable with the outer periphery of the upper surface of the sheet, the ring being provided with clips engageable underneath the outer periphery of the plate for pressing the outer peripheries both up against the support ring.

4,519,830

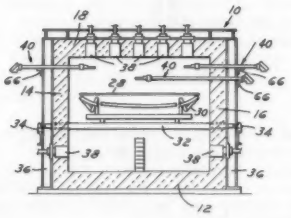
TEMPERATURE SENSING STRUCTURE FOR A FURNACE

Ronald G. Wolak, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 25, 1984, Ser. No. 603,866

Int. Cl.³ C03B 5/24

U.S. Cl. 65—162 **3 Claims**



1. In a glass bending furnace having wall structures in which radiant heat generating devices passing therethrough are used to generate heat for heating the interior of the glass bending furnace, an improved temperature sensing structure which comprises:

a thermocouple element, said thermocouple element having a pair of thermocouple leads terminating in a junction end which defines a planar loop portion of said thermocouple element;

mounting means for mounting said pair of thermocouple leads with said planar loop portion of said thermocouple element projecting outwardly from a free end of said mounting structure;

a radiation reflective, heat shielding protection tube having (1) an elongated portion in surrounding relationship to said mounting means which mounts said pair of thermocouple leads, and (2) a free end portion which surrounds all but a facing portion of said planar loop portion of said thermocouple, said surrounding part of said free end portion of said protection tube being positioned so that said facing planar loop portion of said thermocouple element lies in a plane in facing relationship to an unsurrounding part of said free end portion of said protection tube;

quartz tube means for enclosing said planar loop portion of said thermocouple element; said quartz tube means being generally opaque to infrared wavelengths longer than about 7 microns and transparent to shorter wavelengths;

means for positioning said protection tube in a wall structure of the glass bending furnace so that said unsurrounding part of said free end portion of said protection tube is in facing relationship with a radiant heat generating device passing through a wall structure of the glass bending structure, whereby said planar portion of said thermocouple element, which is protected by said quartz tube means can give an accurate reading of the radiation being

given off by the radiant heat generating device in facing relationship thereto.

4,519,831
METHOD OF CONVERTING SEWAGE SLUDGE TO FERTILIZER

William P. Moore, Hopewell, Va., assignor to Hawkeye Chemical Company, Clinton, Iowa

Filed Oct. 17, 1983, Ser. No. 542,431
Int. Cl.³ C05F *7/00*
U.S. Cl. 71—13 **15 Claims**

1. A method of converting sewage sludge solids in controlled release, attrition resistant fertilizer agglomerates comprising:

(a) forming a fertilizer premix by comingling sewage sludge solids containing 1 part of nitrogen with uncondensed liquid ureaform containing between 1 and 6 parts nitrogen and having a urea to formaldehyde mol ratio of between 1 and 2 and a nitrogen concentration between 20 and 32 percent; said ureaform being prepared by reaction of 1 mol of formaldehyde with between 1.5 and 1.8 mols urea at 80° to 95° C. for 60 to 120 minutes under the influence of an alkali catalyst, and contains between 0.8 and 2.0 percent free ammonia and between 24 and 32 percent total nitrogen;

(b) distributing sufficient acidic material throughout the fertilizer premix to acidify it to a pH of between 4 and 6;

(c) heating the acidified fertilizer premix to a temperature between 60° and 120° C. for between 5 and 60 minutes;

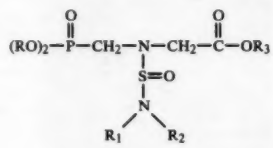
(d) compressing the heated fertilizer premix between solid surfaces at a pressure between about 500 and 10,000 pounds per square inch until controlled release, attrition resistant, fertilizer agglomerates are formed.

4,519,832
UNSYMMETRICAL AMINOSULFINAMIDE DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE TRIESTERS, HERBICIDAL COMPOSITIONS AND USE

James A. Sikorski, Kirkwood, and Mary A. Hoobler, Olivette, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Apr. 27, 1984, Ser. No. 605,003
Int. Cl.³ C07F *9/40*; A01N *57/20, 57/24*
U.S. Cl. 71—87 **30 Claims**

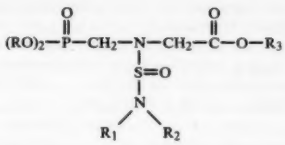
1. A compound represented by the formula



(I)

wherein R is selected from the group consisting of phenyl, or phenyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkynyl, aralkyl and R; or R_1 and R_2 are independently selected from the aforerecited groups and joined together through nitrogen to form a cyclic structure having 4–8 atoms; and R_3 is lower alkyl or aralower alkyl.

11. A herbicidal composition comprising an adjuvant and a herbicidally effective amount of a compound represented by the formula



(I)

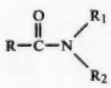
wherein R is selected from the group consisting of phenyl, or phenyl substituted with from 1 to 3 substituents independently selected from the group consisting of lower alkyl, lower alkoxy, trifluoromethyl, nitro and halogen; and wherein R_1 and R_2 are independently selected from the group consisting of alkyl, cycloalkyl, alkenyl, alkynyl, aralkyl and R; or R_1 and R_2 are independently selected from the aforerecited groups and joined together through nitrogen to form a cyclic structure having 4–8 atoms; and R_3 is lower alkyl or aralower alkyl.

4,519,833
HERBICIDE COMPOSITIONS

Ferenc M. Pallos, Walnut Creek; Mervin E. Brokke, Moraga, and Duane R. Arneklev, Sunnyvale, all of Calif., assignors to Stauffer Chemical Co., Westport, Conn.

Division of Ser. No. 147,434, May 7, 1980, Pat. No. 4,392,884, which is a division of Ser. No. 930,967, Aug. 4, 1978, Pat. No. 4,269,618, which is a division of Ser. No. 208,041, Dec. 9, 1971, Pat. No. 4,137,070, which is a continuation-in-part of Ser. No. 134,868, Apr. 16, 1971, abandoned. This application Aug. 13, 1981, Ser. No. 292,330
Int. Cl.³ A01N *25/32*
U.S. Cl. 71—100 **10 Claims**

1. A herbicidal composition comprising an active herbicidal thiocarbamate compound and a non-phytotoxic antidotally effective amount of an antidote therefor corresponding to the formula



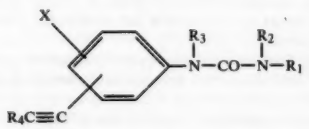
wherein R is $CHCl_2$—, R_1 and R_2 can be the same or different and can be selected from C_2–C_{20} cyanoalkyl, hydrogen, C_2–C_{12} alkenyl and C_1–C_{12} alkyl, provided that at least one of R_1 or R_2 is C_2–C_{20} cyanoalkyl.

4,519,834
HERBICIDAL ETHYNYL-PHENYLUREAS

Henry Szczepanski, Rheinfelden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 214,813, Dec. 9, 1980, Pat. No. 4,406,691. This application Jul. 11, 1983, Ser. No. 512,273
Claims priority, application Switzerland, Dec. 18, 1979, 11214/79
Int. Cl.³ A01N *37/00, 37/44, 47/30*; C07C *155/02*
U.S. Cl. 71—100 **17 Claims**

1. An ethynylphenylurea of the formula



wherein

R_1 is hydrogen; C_1–C_6-alkyl; C_1–C_6-alkoxy; C_2–C_6-alkenyl; phenyl optionally substituted by halogen; or benzyl optionally substituted by halogen;

R_2 is hydrogen; C_1–C_6-alkyl; C_3–C_6-cycloalkyl; C_2–C_6-alkenyl; or benzyl optionally substituted by halogen;

R_3 is hydrogen or C_1–C_4-alkyl;

R_4 is hydrogen; C_1–C_{12}-alkyl optionally substituted by hydroxy, halogen, C_1–C_4-alkoxy, C_2–C_8-alkoxyalkoxy, C_1–C_4-alkoxycarbonyl, $-N(R_1)(R_2)$, $-N(R_1)COOR_2$, $-N(R_1)COSR_2$ $-N(R_1)CON(R_1)(R_2)$; C_2–C_{12}-alkenyl optionally substituted by halogen, hydroxy, C_1–C_4-alkoxy, C_2–C_8-alkoxyalkoxy or C_1–C_4-alkoxycarbonyl; C_3–C_{12}-cycloalkyl or cycloalkenyl, which is mono-or bicyclic and which can be substituted by halogen, hydroxy or C_1–C_4-alkoxy; and

X is hydrogen; halogen; C_1–C_4-alkyl; C_1–C_4-alkoxy; or nitro.

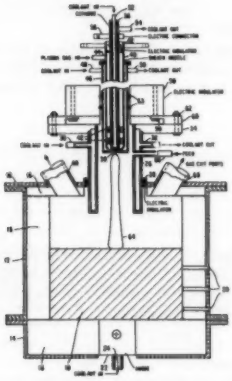
13. A method for combating undesirable plant growth which comprises applying thereto a herbicidally effective amount of an ethynylphenylurea of claim **1**.

4,519,835

TRANSFERRED-ARC PLASMA REACTOR FOR CHEMICAL AND METALLURGICAL APPLICATIONS

William H. Gauvin, Beaconsfield, and George R. Kubanek, Baie d'Urfé, both of Canada, assignors to Hydro-Quebec, Montreal, Canada

Division of Ser. No. 382,415, May 26, 1982, Pat. No. 4,466,824. This application May 23, 1984, Ser. No. 613,387
Claims priority, application Canada, Jul. 30, 1981, 382889
Int. Cl.³ C22B *4/00*
U.S. Cl. 75—10 R **13 Claims**



1. A process for high temperature treatment of feed material using a plasma reactor comprising a bottom portion forming a crucible for receiving molten material, a sleeve mounted on top of the crucible, a cathode assembly including a cathode mounted on top of the said sleeve and electrically insulated therefrom, means for injecting a plasma forming gas into the reactor adjacent to the cathode, an anode, and gas exit ports in the bottom portion of the reactor, comprising the steps of:

(a) mounting said anode in the crucible in contact with the molten material in the crucible but electrically insulated from the sleeve;

(b) supplying feed material conveyed by a carrier gas near the top of said sleeve at a pressure such that the material is fed against the inner wall of the sleeve;

(c) establishing a plasma arc between the cathode and anode via the molten material in the crucible to melt the feed material and to form a falling film of molten material on the inside wall of the sleeve which drops in the crucible underneath; and

(d) tapping the molten material from the crucible.

4,519,836

METHOD OF PROCESSING LEAD SULPHIDE OR LEAD-ZINC SULPHIDE ORES, OR SULPHIDE CONCENTRATES, OR MIXTURES THEREOF

Anatoly P. Sychev; Jury I. Sannikov; Jury A. Grinin; Ivan P. Polyakov, and Jury M. Abdeev, all of Ust-Kamenogorsk, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Institut Tsvetnoi Metallurgii, Ust-Kamenogorsk, U.S.S.R.

Filed Jul. 20, 1983, Ser. No. 515,939
Int. Cl.³ C22B *13/00*
U.S. Cl. 75—25 **7 Claims**

1. A method for the recovery of lead from a mixture comprising lead and iron sulphides optionally further containing one or both of zinc and copper sulphides which comprises (1) admixing said sulphides with fluxes, (2) oxidizing the sulphide in the presence of said fluxes to produce oxides of the metals present including ferrous oxide and lead oxide and (3) passing the oxidized product so obtained in the form of metal oxide droplets into a bed of solid carboniferrous material to effect selective reduction of lead oxide to lead leaving a slag containing other metals present in oxide form

wherein

(a) said fluxes are lime- and silicon dioxide-containing fluxes said fluxes may optionally contain aluminum oxide and magnesium oxide and are employed in amounts to result in the following ratios being present in the oxidized product: sum of silicon dioxide and any aluminum dioxide present:ferrous oxide of 0.67 to 1.22:1, sum of calcium oxide and any magnesium oxide present:ferrous oxide of 0.22 to 0.75:1

(b) dust is obtained in the oxidation and is recycled to be mixed with the fluxes and the sulphides

(c) the oxidation is effected by feeding said mixture of sulphides, fluxes and recycled dust in suspended state in an oxygen into a vertical flame to effect 85–100 percent desulfurization thereby producing droplets of oxides of the metals and

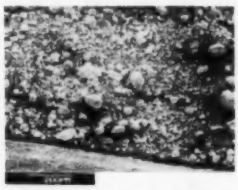
(d) the carboniferrous material into which said droplets are passed is selected from the group consisting of coke and coal.

4,519,837

METAL POWDERS AND PROCESSES FOR PRODUCTION FROM OXIDES

Michael G. Down, Plum Borough, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 309,863, Oct. 8, 1981, abandoned. This application Apr. 26, 1984, Ser. No. 604,398
Int. Cl.³ B22F *9/00*
U.S. Cl. 75—0.5 B **15 Claims**



1. A process for reducing a metal oxide to a substantially unoxidized metal powder, comprising the steps of:

(a) forming a reaction mixture of said metal oxide in a quantity of a liquid metal reducing agent in excess of that stoichiometrically required to fully reduce said metal oxide wherein said liquid metal reducing agent is selected from the group consisting of lithium-magnesium solutions and lithium-calcium solutions;

(b) reacting said metal oxide with said liquid metal reducing agent at a temperature below approximately 600° C. until

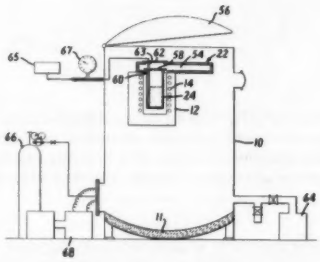
said metal oxide has been substantially reduced to said unoxidized metal powder except for minor impurity levels of oxygen.

4,519,838

APPARATUS AND PROCESS FOR PRODUCING PREDOMINATELY IRON ALLOY CONTAINING MAGNESIUM

James E. Wells, III, Kenmore, N.Y., assignor to Elkem Metals Company, Pittsburgh, Pa.

Filed Sep. 15, 1982, Ser. No. 418,238
Int. Cl.³ C22C *33/00*
U.S. Cl. 75—129 **12 Claims**



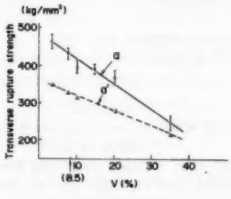
1. A process for producing a predominately iron alloy containing magnesium in a charge vessel and associated cooling medium which comprises the steps of forming an alloy charge in said vessel which is predominately iron and includes at least about 0.5% magnesium by weight, supplying a gas under pressure that is inert to magnesium vapor, maintaining the charge in said vessel in an atmosphere of such inert gas at a pressure greater than the vapor pressure of magnesium at the melt temperature, heating the charge to melt temperature in said atmosphere of inert gas to form an alloy melt, removing and transferring the molten alloy from said vessel into a cooling medium where the alloy melt is rapidly cooled and solidified to produce a solid alloy ingot.

4,519,839

SINTERED HIGH VANADIUM HIGH SPEED STEEL AND METHOD OF MAKING SAME

Ishibachi Toyoaki; Yoshihara Minoru; Takuma Takashi; Fuke Yasunori, and Maeda Masayuki, all of Tokyo, Japan, assignors to The Furukawa Electric Co., Ltd.; Kanto Denka Kogyo Co., Ltd. and Fujidie Co., Ltd., all of Tokyo, Japan

PCT No. PCT/JP82/00113, § 371 Date Dec. 8, 1982, § 102(e) Date Dec. 8, 1982, PCT Pub. No. WO82/03412, PCT Pub. Date Oct. 14, 1982
Continuation of Ser. No. 448,855, Dec. 8, 1982, abandoned. This PCT application Apr. 8, 1982, Ser. No. 657,455
Claims priority, application Japan, Apr. 8, 1981, 56-52709
Int. Cl.³ C22C *33/02, 38/24, 38/36;* B22F *1/00*
U.S. Cl. 75—242 **3 Claims**



1. A sintered high vanadium high speed steel consisting essentially of C 1.4–6.2, W+2Mo 10.0–24.0, Cr 3.0–6.0, V 8.5–38, Co less than 17, all in weight%, the remainder Fe and inevitable impurities, characterized by a process of manufacture comprising the steps of preparing a powder mixture consisting of the oxides of the steel-forming metals and carbon, the amount of the carbon nearly equalling a sum of that for dissolution and carbide formation and half of that for reducing said metal oxides to carbon monoxide, pulverizing said mixture intimately down to below 10 microns, heating said finely pulverized mixture in a stream of hydrogen at a temperature between 900° and 1100° C. and for a sufficient time, whereby said mixture is reduced to an alloyed powder, pulverizing said alloyed powder again down to below 10 microns, with necessary carbon and/or composition adjustments made, preparing a compact from said pulverized alloyed powder, solid phase sintering said compact in a vacuum to a density of 95% or higher, and subjecting said sintered compact to a heat treatment, whereby a martensitic matrix is produced.

4,519,840

HIGH STRENGTH, WEAR AND CORROSION RESISTANT COATINGS

John E. Jackson, Brownsburg; Thomas A. Adler, Indianapolis; Jean M. Quets, Indianapolis, and Robert C. Tucker, Jr., Brownsburg, all of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Oct. 28, 1983, Ser. No. 546,480
Int. Cl.³ C09D *5/00*
U.S. Cl. 106—1.05 **12 Claims**

1. A coating composition applied to a substrate by a thermal spray process which consists essentially of from about 11.0 to about 18.0 weight percent cobalt, from about 2.0 to about 6.0 weight percent chromium, from about 3.0 to about 4.5 weight percent carbon and the balance tungsten.

4,519,841

OFFSET PRINTING INK

John T. Moynihan, Herndon, Va., assignor to American Newspaper Publishers Association, Washington, D.C.

Continuation-in-part of Ser. No. 337,220, Jan. 6, 1982, Pat. No. 4,419,132. This application Nov. 30, 1983, Ser. No. 556,471
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.³ C09D *11/06*
U.S. Cl. 106—27 **4 Claims**

1. An offset printing ink comprising:
a. Carbon black in the range 10% to 27.8%,
b. Gilsonite in the range 17.6% to 23.5%, and
c. Tall oil fatty acid in the range 50.1% to 54.9%.

4,519,842

ADMIXTURE AND METHOD FOR IMPROVING HYDRAULIC CEMENT MIXES

Arthur H. Gerber, Beachwood, Ohio, assignor to Martin Marietta Corporation, Bethesda, Md.

Continuation-in-part of Ser. No. 352,626, Feb. 26, 1982, Pat. No. 4,401,472. This application Aug. 29, 1983, Ser. No. 527,533
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.³ C04B *7/35*
U.S. Cl. 106—90 **29 Claims**

1. A hydraulic cement mix comprising a hydraulic cement, aggregate in an amount of up to 80 percent by weight based upon the total weight of said cement mix, sufficient water to effect hydraulic setting of the cement, and an additive selected from the group consisting of poly(hydroxyalkylated)polyamine, alkoxylated poly(hydroxyalkylated)polyamine hydroxyalkylated derivatives of the compounds hydrazine, 1,2-diaminopropane, and polyglycoldiamine, and mixtures thereof, said additive being present in an amount sufficient to increase the compressive strength of the hardened mix.

4,519,843

MODIFIED POLYALKYLENEPOLYAMINES

Stephen B. Willis, Lake Jackson, and Pamela J. Boyce, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 586,374, Mar. 5, 1984, Pat. No. 4,482,667, which is a continuation-in-part of Ser. No. 548,475, Nov. 3, 1983, Pat. No. 4,461,856. This application Aug. 8, 1984, Ser. No. 638,824

Int. Cl.³ C04B *7/35, 25/06;* **C08G** *59/00*

U.S. Cl. 106—90 **10 Claims**

1. In aqueous hydraulic cement slurry compositions comprising water, hydraulic cement, surfactant and polyalkylenepolyamine fluid loss additive; the improvement which comprises employing as said fluid loss additive, at least one composition prepared by reacting

(A) at least one alkylenediamine or polyalkylenepolyamine composition having an average molecular weight of from about 60 to about 500; with

(B)

(1) at least one epihalohydrin, dihalohydrin or mixture thereof; or

(2) a mixture of

(a) at least one epihalohydrin, dihalohydrin or mixture thereof; and

(b) at least one alkylene dihalide, and

(C) optionally, one or more adducts of

(1) at least one epihalohydrin, dihalohydrin or mixture thereof; and

(2) at least one alkylenediamine or polyalkylenepolyamine having an average molecular weight of from about 60 to about 500 or a mixture thereof; wherein components (A), (B) and (C) are employed in quantities which provide a non-gelled polyamine which gives a fluid loss of less than 60 ml, preferably less than about 45 according to the API RP 10B fluid loss test described in the examples.

4,519,844

WATER SOLUBLE BIOGUM COMPOSITIONS AND HYDROSOLS PREPARED THEREFROM

Jean-Bernard Chaux; Pierre Gagne, both of Tassin La Demi-Lune; Michel Garcia, Antony; Dominique Lespinasse, Jassans Riottier, and Josiane Roussos, Neuilly sur Seine, all of France, assignors to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Continuation of Ser. No. 442,004, Nov. 16, 1982, abandoned. This application Jan. 25, 1983, Ser. No. 460,771

Claims priority, application France, Nov. 16, 1981, 81 21358

Int. Cl.³ C08L *5/00*

U.S. Cl. 106—209 **25 Claims**

1. A composition of matter adapted for ready dispersion/dissolution in an aqueous medium, comprising an intimate admixture of from 30 to 70% by weight of a water soluble biogum heteropolysaccharide, from 7 to 40% by weight of a dispersion/dissolution enhancing water donor material therefor, from 15 to 37% by weight of water and from 0–10% by weight of an anionic or nonionic surfactant.

7. The composition of matter as defined by claim 1, said water donor comprising a finely divided silica, a hydrated silica gel, a dehydrated silica gel, an alumina hydrate, an argilla, a natural or synthetic zeolite, or a hydrate of an inorganic or organic salt.

4,519,845

SEPARATION OF SUCROSE FROM MOLASSES

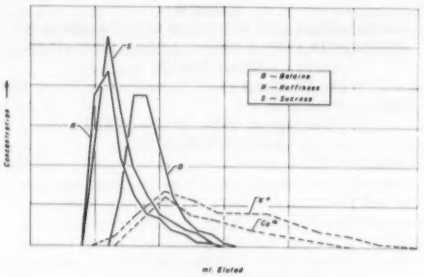
Di-Yi Ou, La Grange, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Feb. 9, 1984, Ser. No. 578,464

Int. Cl.³ C13D *3/12*

U.S. Cl. 127—46.2 **12 Claims**

1. A process for the separation of sucrose from molasses feedstock through a bed of adsorbent comprising a mixture of an ion retardation resin and a calcium and potassium ion exchanged nuclearly sulfonated styrene cation exchanged resin having about 8% crosslinkage, said adsorbent having a higher



relative selectivity for mineral salts and betaine components of said feedstock than for sucrose, adsorbing said mineral salts and betaine components in said adsorbent bed and removing a product stream comprising sucrose from said adsorbent bed.

4,519,846

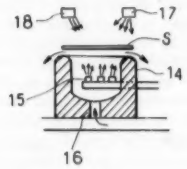
PROCESS FOR WASHING AND DRYING A SEMICONDUCTOR ELEMENT

Seiichiro Aigo, 3-15-13, Negishi, Daito-ku, Tokyo, Japan

Filed Mar. 8, 1984, Ser. No. 587,580

Int. Cl.³ B08B *3/02*

U.S. Cl. 134—15 **6 Claims**



1. A process for washing and drying a semiconductor element wherein one surface of the element has been subjected to etching, which process comprises:

(a) holding the semiconductor element horizontally with the etched surface directed downwards over a water-washing tank having essentially vertical side walls and a dished bottom and pre-washing the etched surface of the semiconductor element with water jetted out from water nozzles provided in the tank;

(b) washing the etched surface with pure water by blowing the pure water upwardly against said etched surface from a port in the bottom of the tank;

(c) while washing the etched surface with pure water, simultaneously washing the other, upwardly-facing, surface of the semiconductor element by causing water to fail onto the upwardly-facing surface; and then

(d) spinning the semiconductor element to spin-dry the same.

4,519,847

PREVENTION AND REMOVAL OF STAINS IN POOLS AND SPAS

Aaron Milligan, 6797 Valinda Ave., Alta Loma, Calif. 91701

Filed Dec. 12, 1983, Ser. No. 560,418

Int. Cl.³ A45B *25/06*

U.S. Cl. 134—28 **2 Claims**

1. A method of removing cobalt stains from fiberglass com-

prising mixing a quantity of a mixture of benzalkonium chloride, EDTA Na4 and soft water in a quantity of muriatic acid and washing said fiberglass therewith.

4,519,848

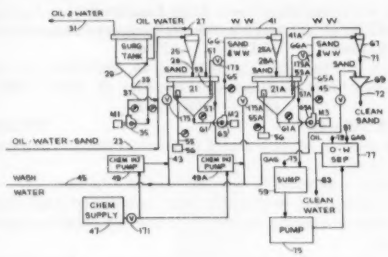
SEPARATOR

Gene E. Underwood, P.O. Box 2685, Conroe, Tex. 77305

Continuation of Ser. No. 387,503, Jun. 11, 1982, abandoned. This application May 8, 1984, Ser. No. 608,262

Int. Cl.³ B08B *3/00*

U.S. Cl. 134—34 **20 Claims**



1. A system for cleaning material from solid particles, comprising:

a container having a top end, a bottom end and side wall structure extending between said top end and said bottom end,

upper wall structure having an opening formed therethrough leading to an upper zone,

means for separating a liquid material and solid particles from a mixture of the solid particles and the liquid material, after separation, the solid particles having a film of the material thereon,

particle injecting means for injecting the separated solid particles to be cleaned into the top portion of said container radially outward from said opening,

means separate from said particle injecting means for injecting a liquid into said container in a direction to cause the solid particles tc swirl around and against said side wall structure of said container for causing the material to be removed from the solid particles, whereby the material flows upward through said opening and into said upper zone and liquid and solid particles flow downward to the bottom end of said container,

an outlet coupled to said upper zone for removing the material from said upper zone, and

a lower outlet coupled to the bottom end of said container for removing the solid particles and liquid from the bottom end of said container.

20. A method of cleaning material from solid particles in a container having a top end, a bottom end, side wall structure extending between said top end and said bottom end, upper wall structure having an opening formed therethrough leading to an upper zone, an upper outlet coupled to said upper zone, and a lower outlet coupled to the bottom end of said container, comprising the steps of:

injecting the solid particles to be cleaned into the top portion of said container radially outward of said opening,

injecting a liquid into said container in a direction to cause the solid particles to swirl around and against said side wall structure of said container for causing the material to be separated from the solid particles,

flowing the separated material upward through said opening and into said upper zone and flowing said liquid and solid particles downward to the bottom end of said container,

flowing the separated material from said upper zone through said upper outlet, and

flowing the solid particles and liquid at the bottom end of said container through said lower outlet.

4,519,849

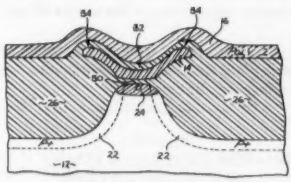
METHOD OF MAKING EPROM CELL WITH REDUCED PROGRAMMING VOLTAGE

George J. Korsh, Redwood City; Mark A. Holler, Milpitas; George Perlegos, Cupertino, and Paolo Gargini, Palo Alto, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Division of Ser. No. 196,838, Oct. 14, 1980, Pat. No. 4,412,310. This application Jul. 22, 1983, Ser. No. 515,990

Int. Cl.³ H01L *21/22, 21/26*

U.S. Cl. 148—1.5 **3 Claims**



1. In the fabrication of an MOS electrically programmable read-only memory cell wherein a layer of polysilicon is formed insulated from a substrate, said layer being used to define a floating gate member for said cell, an improvement comprising the steps of:

forming an oxide layer of a predetermined thickness over said polysilicon layer;

forming a silicon nitride layer over said oxide layer;

etching said silicon nitride layer, oxide layer and polysilicon layer so as to define a dimension of said floating gate member;

subjecting said substrate to an elevated temperature so as to grow an oxide region at edges of said floating gate member such that a thicker oxide develops at said edges of said floating gate member when compared to said oxide layer at the central portion of said floating gate member;

whereby said edges of said floating gate are protected by a thicker oxide region thereby reducing undesirable loss of charge from said floating gate member to overlying structures.

4,519,850

PROCESS FOR THE THERMO-MIGRATION OF LIQUID PHASES

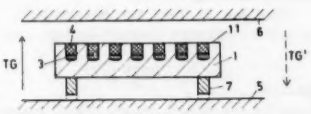
Petra Kluge-Weiss, Birmenstorf, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Aug. 18, 1983, Ser. No. 524,327

Claims priority, application 08241982, Aug. 24, 1982, 82201054

Int. Cl.³ H01L *21/225*

U.S. Cl. 148—1.5 **11 Claims**



1. A process for the thermo-migration of liquid phases comprising the steps of:

covering at least partially a plane surface of a semiconducting substrate with a layer of metal, the melting point of said metal being substantially lower than the melting point of said semiconducting substrate;

forming a molten zone from said metal and the material of

said semiconducting substrate at a temperature lying between said two melting points, and in an inert gas atmosphere;

pumping off said inert gas atmosphere after said formation of said molten zone;

establishing a first thermal gradient essentially perpendicular to said plane surface of said semiconducting substrate by means of two flat, parallel and uniformly heated faces;

migrating said molten zone into said semiconducting substrate under vacuum conditions until it reaches a predetermined depth;

establishing a second thermal gradient which is parallel to said first thermal gradient and has an opposite direction by lowering the temperature of the warmer of said two faces and raising the temperature of the cooler of said two faces; and

migrating said molten zone from said predetermined depth back to said plane surface of said semiconducting substrate under vacuum conditions.

4,519,851

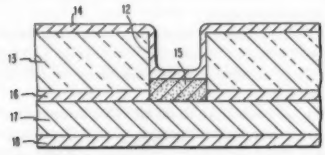
METHOD FOR PROVIDING PINHOLE FREE DIELECTRIC LAYERS

Charles H. Perry, and Robert R. Shaw, both of Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1984, Ser. No. 621,335

Int. Cl.³ C23F *7/02*

U.S. Cl. 148—6.31 **6 Claims**



1. A method for forming a pinhole defect free dielectric layer over a substrate-supported conductive metallurgical pattern comprising the steps of:

forming said pattern with a top film of oxidizable metal, the metal oxide of which is nonconductive;

coating said pattern with a dielectric layer; and,

converting all of said oxidizable metal top film which is exposed by said pinholes to a nonconductive material by treating the entire substrate to an oxidation process, said process oxidizing the exposed metal while leaving said dielectric and said underlying pattern unchanged.

4,519,852

ANNEALING OF HIGH SPEED STEEL POWDER

Robert J. Causton, Delran, N.J., assignor to Davy McKee (Sheffield) Limited, Sheffield, England

Filed Jan. 20, 1983, Ser. No. 459,503

Claims priority, application United Kingdom, Jan. 21, 1982, 8201699

Int. Cl.³ B22F *0/1*

U.S. Cl. 148—16 **8 Claims**

1. A process for annealing a predetermined quantity of high speed steel powder having a hardness of the order of 550–600 Vickers and an oxygen content of 1500–2000 parts per million, comprising the steps of:

heating said predetermined quantity of said powder to a maximum temperature of approximately 1050° C.;

holding said predetermined quantity of powder at said maximum temperature for approximately one hour;

quenching said predetermined quantity of powder with a non-oxidizing gas so as to rapidly reduce the temperature of said predetermined quantity of powder to an intermediate temperature value of between 700°–780° C.;

holding said predetermined quantity of powder at said intermediate temperature value of between 700°–780° C. for approximately one hour; and

quenching said predetermined quantity of powder with a non-oxidizing gas so as to rapidly reduce the temperature of said predetermined quantity of powder to ambient.

4,519,853

METHOD OF CARBURIZING WORKPIECE

Michel Kostelitz, Versailles, and Philippe Queille, Viroflay, both of France, assignors to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude, Paris, France

Filed May 23, 1983, Ser. No. 496,934

Claims priority, application France, May 28, 1982, 82 09328

Int. Cl.³ C23C *11/10*

U.S. Cl. 148—16.5 **19 Claims**

1. A method of carburizing metal workpieces, comprising the steps of:

loading workpieces to be carburized in a furnace;

maintaining the workpieces in a carbon enriching atmosphere containing carbon monoxide, hydrogen and nitrogen;

carrying out a first phase of the treatment at a first temperature from 850° to 1050° C.;

carrying out a second phase of the treatment directly thereafter at a second temperature, lower than said first temperature, from 700° C. to 950° C.;

using an atmosphere for the first phase containing at least 1% nitrogen, from about 20% to about 50% carbon monoxide by volume and from about 40% to about 75% hydrogen by volume and having a carbon potential of from about 1.1% to about 1.6% by weight; and

increasing the amount of nitrogen in said atmosphere for carrying out the second phase from two to thirty times the amount of nitrogen in the atmosphere used for the first phase so that the carbon potential for the second phase remains significant, but is reduced at least 0.5% by weight below the carbon potential for the first phase, such that the length of the combined first and second phases is less than for a conventional carburizing treatment.

4,519,854

PROCESS AND APPARATUS FOR HEAT TREATMENT OF STEEL MATERIAL SUCH AS OF SOFT STEEL OR THE LIKE

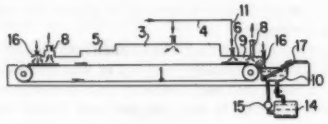
Yasuo Nakanishi, Iruma; Kazunori Sakamoto, Kawagoe; Giichi Ando, Kawagoe, and Teruoki Watanabe, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 925,690, Jul. 18, 1978, abandoned. This application Dec. 29, 1983, Ser. No. 585,877

Claims priority, application Japan, Jul. 21, 1977, 52-86602

Int. Cl.³ B23K *1/04*

U.S. Cl. 148—127 **5 Claims**



1. A process for preparing a brazed steel article from steel parts to be joined by solder which consists essentially of the steps of heating said parts with said solder to a brazing temperature of 1100°–1200° C., to effect joining thereof, followed by cooling the brazed steel article in a furnace to a temperature of

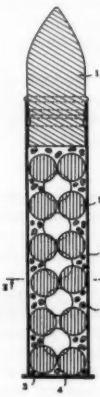
about 570°–720° C. in 5–10 minutes and then rapidly cooling the brazed steel article, wherein said steel contains from 0.02 to 0.25% carbon.

4,519,855

MIXED CHARGES FOR AMMUNITIONS WITH A CASING CONSTITUTED BY AGGLOMERATED PROPELLANT POWDER AND PROPELLANT POWDER IN GRAIN FORM

Louis J. J. Leneveu, and Didier J. Treneules, both of Chateaulin, France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Dec. 2, 1982, Ser. No. 446,476
Claims priority, application France, Dec. 17, 1981, 81 23560
Int. Cl.³ C06B *45/02*
U.S. Cl. 149—21 **4 Claims**



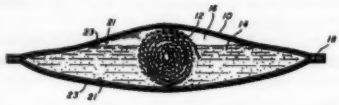
1. A mixed charge for ammunition with a casing constituted by a mixture of fragmentable propellant charges constituted by propellant powder in agglomerated form and propellant powder in the form of grains, characterized by the fact that said fragmentable charges are in the form of spheres of diameter smaller than the diameter of the orifice of the charge of said casing and the number of the spheres per layer is 1, 2, 3 or 4.

4,519,856

RESIN-CLOTH STRUCTURAL SYSTEM

Richard J. Lazzara, Lake Worth, Fla., assignor to Neptune Research, Inc., Palm Beach, Fla.

Filed Jun. 9, 1983, Ser. No. 502,644
Int. Cl.³ B29C *27/30*
U.S. Cl. 156—49 **11 Claims**



6. A method of applying a construction material to an article comprising impregnating a fabric with a resinous mastic which hardens upon exposure to aqueous moisture, isolating said mastic-impregnated fabric from moisture until application thereof to said article, removing said mastic-impregnated fabric from its isolation and applying said mastic-impregnated fabric directly to said article in the presence of aqueous moisture or water.

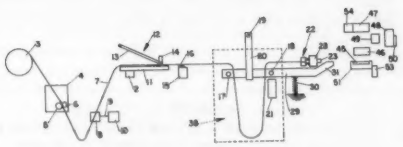
11. A method according to claim **6** in which said mastic-impregnated fabric is adhered directly to a joint of uninsulated electrical conductors.

4,519,857

ELASTIC BAND SEALER APPARATUS AND METHOD FOR FORMING A CONTINUOUS NON-OVERLAPPING BAND

Bobby J. Clay, Cincinnati, Ohio, assignor to Natmar, Inc., Cincinnati, Ohio

Filed Oct. 5, 1983, Ser. No. 538,817
Int. Cl.³ B29D *23/10*; B65H *69/08*
U.S. Cl. 156—64 **16 Claims**



1. An elastic band sealer comprising:
(a) means to feed elastic from a source of elastic;
(b) means to pull said elastic from said feed means;
(c) means to serrate said elastic into a strip after it is pulled said strip having ends; and
(d) means to fuse said strip into an elastic band including means to rotate said ends toward one another to form a continuous band without any overlapping of said strip.

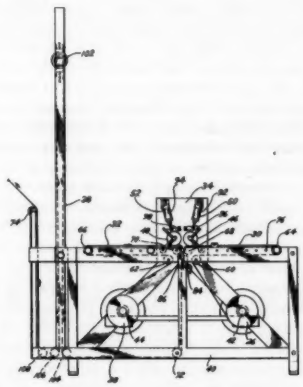
10. A method of forming a continuous non-overlapping band from a source of material comprising:
(a) extending a length of said material in one plane from said source;
(b) measuring said material in another plane substantially perpendicular to said one plane;
(c) cutting said material into a strip after said material is extended; and
(d) fusing said strip into a continuous non-overlapping band.

4,519,858

SPLICER

John R. Martin, Rockford, Ill., assignor to Martin Automatic, Inc., Rockford, Ill.

Filed Mar. 7, 1984, Ser. No. 587,243
Int. Cl.³ B65H *19/08*
U.S. Cl. 156—64 **18 Claims**



1. A web splicer comprising:
a frame;

an anvil mounted to the frame;

a hammer mounted to the frame adapted to automatically hammer the anvil;

a first web guide mounted to the frame adjacent the hammer adapted to guide a first web between the hammer and anvil;

a second web guide mounted to the frame adjacent the anvil adapted to guide a second web between the hammer and anvil;

a web brake roller mounted to the frame adapted to be moved to and from a position of braking contact against the first web guide; and

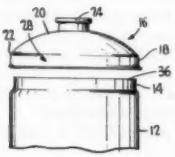
a brake means mounted to the frame for moving the web brake roller to the position of braking contact and thereby brake the first web to a stop, and for releasing the web brake roller.

4,519,859

HEATING SYSTEM FOR AND METHOD OF FINALLY BONDING CONTAINER END UNIT TO BODY

Donald J. Roth, Westport; Charles S. Kubis, Weston, both of Conn.; John Walter, Evergreen Park, Ill., and Glenn R. Mohr, Linthicum, Md., assignors to Continental Can Company, Inc., Stamford, Conn.

Filed Jan. 11, 1984, Ser. No. 569,888
Int. Cl.³ B32B *31/20*
U.S. Cl. 156—69 **20 Claims**



1. An adhesive activator assembly, said assembly being particularly adapted for reheating an adhesive which is bonding an end unit to a container body and finally axially positioning such end unit on its respective container body while the previously applied adhesive is flowable, said adhesive activator assembly comprising a conveyor for conveying containers each including one of said container bodies having thereon in telescoped relation one of said end units along a preselected path, first elongated heater means fixedly disposed longitudinally along said path for gradually heating adhesive of containers while passing along said path to a selected temperature whereat the adhesive is sufficiently flowable, pressing means overlying said path downstream of said first heater means for pressing an end unit into final position, and longitudinally elongated second heater means fixed downstream of said first heater means for maintaining the adhesive at said selected temperature for a selected period of time as the respective container continues passing along said path.

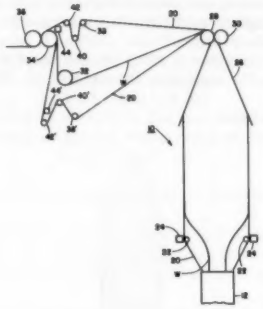
16. A method of forming containers including finally positioning an end unit on a container body wherein the end unit is initially telescoped axially relative to the container body and there is a layer of heat meltable adhesive between the end unit and the container body, said method comprising the steps of serially moving containers, gradually reheating the adhesive of each container body to a temperature whereat the adhesive is freely flowable, while continuing the serial movement of the containers maintaining the adhesive substantially at said temperature, and while the adhesive is substantially at said temperature applying a compressive force on each moving container in an axial direction to further telescope the end unit and the container body and thereby further distribute the adhesive.

4,519,860

METHOD AND APPARATUS FOR THE PRODUCTION OF A HIGH-STRENGTH, TEAR-RESISTANT POLYMER COMPOSITE

Gordon V. Sharps, Jr., Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Nov. 5, 1982, Ser. No. 439,455
Int. Cl.³ B32B *7/04*
U.S. Cl. 156—161 **15 Claims**



1. A method of producing a continuous coextruded plastic composite material consisting of a thermoplastic film web and polymer filaments adhesively bonded thereto; comprising:

(a) extruding a continuous web of a thermoplastic film material from an extrusion die;

(b) concurrently extruding a plurality of oriented thermoplastic filaments from said extrusion die in spaced relationship with said film web, substantially immediately directing the filaments away from the film web to facilitate cooling of the filaments and prevent distortion of the film web and maintaining said film web and filaments apart for a predetermined time interval subsequent to the extrusion from said die to allow for cooling of the filaments and film web;

(c) contacting said film web with said filaments and conveying the superimposed film webs and filaments between first nip rolls after the filaments and film web have been sufficiently cooled to avoid adherence between the filaments and film web and deformation of the web subsequent cooling;

(d) separating said filaments from said film web and imparting tension to said filaments to maintain uniform filament tension and maintain the filaments under a predetermined tensile load;

(e) applying an adhesive to said filaments on at least the surfaces facing towards said film web;

(f) and contacting said film web and the adhesive-coated surfaces of said filaments; and conveying said contacted film web and filaments between second nip rolls to adhesively bond said filaments to said film web and form said composite material.

8. An apparatus for the production of a continuous coextruded plastic composite material consisting of a thermoplastic film web and polymer filaments adhesively bonded thereto; comprising:

(a) a coextrusion die for concurrently extruding a continuous web of thermoplastic material and a plurality of oriented polymer filaments in spaced relationship with said film web and means for substantially immediately directing the filaments away from the film web after extrusion thereof to facilitate cooling of the filaments and to prevent film web distortion

(b) means for orienting and cooling said filaments prior to contacting said film web to prevent adhesion between said film web and said filaments upon superposition therebetween and permitting the filaments and film web to be

sufficiently cooled to facilitate avoiding adherence between the filaments and film web thereafter and distortion of the film during subsequent cooling;

(c) first nip rolls contacting said film web and said filaments, said film web and said filaments being separated after passing between said first nip rolls;

(d) means for imparting a predetermined tension to said filaments and maintaining the filaments under a predetermined tensile load;

(e) means for applying an adhesive to said filaments;

(f) and second nip rolls receiving said film web and adhesive-coated filaments and applying pressure thereto to form said adhesively bonded film web and filament composite material.

4,519,861

METHOD FOR MANUFACTURING A FIBER-REINFORCED PUSH OR PULL ROD

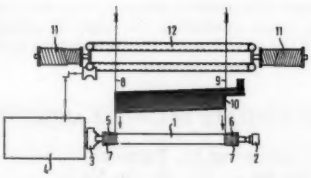
Hans-Günther Christopher, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Feb. 15, 1983, Ser. No. 466,491

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3206088; Dec. 20, 1982, 3247889

Int. Cl.³ B29D *23/12*

U.S. Cl. 156—172 **8 Claims**



1. A method for producing a fiber-reinforced push or pull rod formed of electrically insulating plastic material, the push or pull rod being of the type provided with fittings fastened at respective ends thereof for transmitting compression and tension forces, and wherein the fibers are formed of threads which are oriented parallel to an axis of the rod and are impregnated with a hardenable plastic material, the method comprising the further steps of:

forming a pair of fittings each having a longitudinal axis of symmetry and, on an external surface, a groove with at least one portion disposed substantially in a plane oriented substantially transversely to the longitudinal axis of symmetry of the respective fitting;

winding the threads about a pair of wires arranged to be parallel and at a predetermined distance from one another so as to form a tape wherein the wires form the edges thereof;

inserting the wires at the edges of the tape into respective grooves of the fittings; and

securing the wires in the grooves in a form-locking manner.

4,519,862

METHOD OF MANUFACTURING CUSHION MATERIALS

Muneharu Urai; Tadafumi Abe; Youichirou Haraguchi; Koji Hayashi, and Shigeki Kon, all of Tokyo, Japan, assignors to Tachikawa Spring Co., Tokyo, Japan

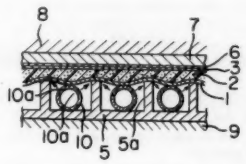
Continuation of Ser. No. 321,638, Nov. 16, 1981, abandoned. This application Oct. 4, 1983, Ser. No. 538,939

Int. Cl.³ B31F *1/00*

U.S. Cl. 156—219 **6 Claims**

1. A method of manufacturing a cushion material by welding under heat a first layer to an adjoining second layer at necessary portions of the latter by use of a welding member having a plurality of spaced pressure applying projections engaging said first layer, said second layer being such that the deforming, melting and flowing temperatures of the material thereof under the influence of heat being higher than those of the material of said first layer, cooling pipes **10** with jet nozzles therein being disposed in the space formed between adjacent pressure applying projections and the surface of said first layer, the method comprising cooling the surface portions of said first layer in the vicinity of but not engaged by said welding member and lying close to said welding member by directing streams of cooling fluid toward portions of the surface of said first layer in the vicinity of the pressure applying projections of said welding member, thereby cooling such portions of said first layer but permitting thermal change on the surface of said first layer to the portions engaged by said welding member.

5. An apparatus for manufacturing a cushion material by welding under heat a first layer to an adjoining second layer at necessary portions of the latter by means comprising a welding member having a plurality of spaced pressure applying projections for engaging said first layer, said second layer being such



that the deforming, melting and flowing temperatures of the material thereof under the influence of heat are higher than those of the material of said first layer, cooling pipes **10** with jet nozzles therein being disposed in space formed between adjacent pressure applying projections and the surface of said first layer, said jet nozzles being directed toward portions of the surface of said first layer in the vicinity of the pressure applying projections of said welding member for primarily cooling such portions of said first layer only without giving rise to any appreciable thermal change on the surface areas of said first layer engaged by said welding member;

a main cooling gas conduit to which all of said cooling pipes for cooling said welding member and the surface of said first layer are connected, an external cooling gas supply conduit, said main cooling conduit automatically joining to said external cooling gas supply conduit during the step of cooling, said main cooling gas conduit being automatically separated from said external cooling gas supply conduit after the step of cooling, and an automatic valve in said external cooling gas supply conduit adapted to be automatically closed after the step of cooling.

4,519,863

METHOD AND DEVICE FOR JACKETING A STEEL PIPE WITH SEVERAL PLASTIC MATERIALS

Helmut Landgraf, Duisburg, and Walter Stucke, Ratingen, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed May 25, 1982, Ser. No. 381,769

Claims priority, application Fed. Rep. of Germany, May 27, 1981, 3121773

Int. Cl.³ B29D *23/04*

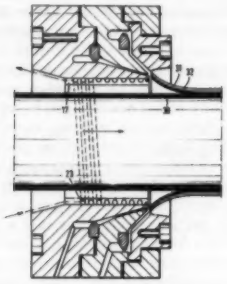
U.S. Cl. 156—244.12 **9 Claims**

1. A method of jacketing a preheated steel pipe, comprising the steps of heating the pipe to about 300° C.;

extruding a first foil of polyethylene and applying the same to the pipe;

extruding a second foil, of a thermoplastic ethylene polymer material and applying the same such that it lodges between the pipe and the first foil using an extrusion head for both of the concurring extrusion steps and maintaining the head at a temperature of about 170° C. and

feeding a gas toward the pipe to be effective on the second material as it is being applied, the gas including air and a



component reacting with the second foil material for rendering the second foil adhesive.

4,519,864

METHOD OF MAKING A PAPER PATTERN FOR DYEING

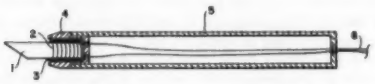
Mineo Isobe, No. 783, Sansho-cho, Suzuka, Mie, Japan

Filed Jul. 11, 1983, Ser. No. 512,815

Claims priority, application Japan, Jul. 14, 1982, 57-122369; Sep. 14, 1982, 57-160254

Int. Cl.³ B32B *31/18*

U.S. Cl. 156—248 **2 Claims**



1. A method of making a paper pattern for dyeing by the use of a paper pattern material comprising a screen and a fusible sheet material bonded thereon, said sheet material being less resistant to heat than the screen, which comprises the steps of:

forming a profile of the pattern of a prototype on the sheet material;

applying the blunt edge of a blade heated to a temperature slightly lower than the fusing temperature of the sheet material to the surface of the sheet material along the profile of the pattern of the prototype;

cutting only the sheet material by the cooperation of pressing and softening with the blade edge; and

peeling off from the screen cut portion of the sheet material corresponding to the profile.

4,519,865

DEVICE FOR TWO-SIDED APPLICATION OF FOILS OR SIMILAR MATERIAL ONTO PLATE-SHAPED WORKPIECES, AND METHOD OF OPERATING THE SAME

Hans J. Bradler, Magstadt; Wilfried Brauner, Kuppingen; Manfred Deyhle, Hildrizhausen, and Karl H. Vogt, Herrenberg, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,863

Claims priority, application European Pat. Off., Feb. 18, 1983, 83101541.7

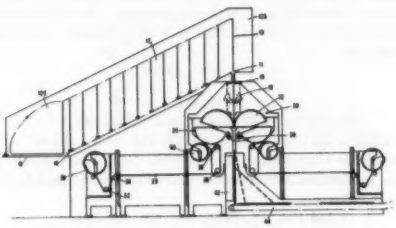
Int. Cl.³ B32B *31/10*

U.S. Cl. 156—256 **16 Claims**

1. An apparatus for laminating a substrate with a lamina, comprising:

a plurality of drums having the lamina disposed thereon, each one of said plurality of drums comprising a plurality of drum segments, said plurality of drum segments of each of said plurality of drums having a segment angle sum of less than 360°, each of said plurality of drum segments of each of said plurality of drums being rotatable about a central axis of each of said plurality of drums without inducing rotation of any other of said drum segments;

first means for cutting the lamina disposed on each of said plurality of drums into discrete lamina segments, each of said lamina segments being disposed on one of said plurality of drum segments of each of said plurality of drums;



second means for conveying the substrate to a position among said plurality of drums; and

third means for forcing one of said lamina segments from one of said plurality of drum segments of at least one of said plurality drums into adhesive abutment with the substrate, said forcing means controlling the angle of coincidence between said one of said lamina segments and the substrate.

4,519,866

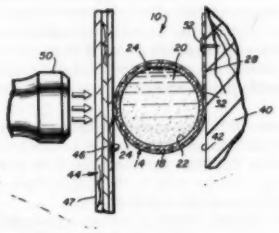
SURFACE-FASTENED FRANGIBLE ADHESIVE CAPSULE

Israel Stol, 639 Rocksprings Rd., Pittsburgh, Pa. 15228

Filed Sep. 21, 1983, Ser. No. 534,243

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—295 **8 Claims**



6. A method for adhering two objects together in a face-to-face manner, comprising:

providing a closed, frangible capsule constituted by a thin, brittle wall containing a filling of liquid adhesive capable of adhering to respective faces of both of the objects and which sets in a matter of seconds when exposed to air;

providing said thin brittle wall with a pattern of grooves constituting a widely distributed network of lines of weakness so that as the capsule is smashed it will comprehensively disintegrate;

providing a hanger constituted by a relatively narrow band of foraminous material through which some of said adhesive may flow as the capsule is smashed;

connecting said hanger to the adhesive containing capsule by wrapping the relatively narrow band externally convolutely about the capsule at least once, leaving an integral tail portion for use in temporarily fastening the capsule to one of said objects;

temporarily hangingly securing the adhesive-containing

capsule onto a respective face of one of the objects using the hanger tail;

bringing the other object into face-to-face confronting relation with the one object; and

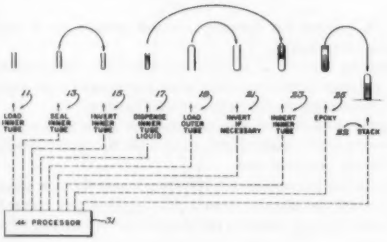
pressing the objects together so as to cause the adhesive-containing capsule to smash, and the adhesive to become released and spread between the two pressed-together objects, adhering the two objects together.

4,519,867

APPARATUS FOR AUTOMATED ASSEMBLY OF SHOCK DETECTORS

Ulyss R. Rubey, Lewisville, Tex., assignor to Detectors, Inc., Graham, Tex.

Filed May 14, 1984, Ser. No. 609,815
Int. Cl.³ B31F *5/00*
U.S. Cl. 156—351 **13 Claims**



1. Apparatus for automated assembly of shock detectors having an indicator means within an inner tube sealingly disposed within an outer tube, the indicator means being adapted for indicating when a shock greater than a predetermined magnitude has been experienced; comprising:

a. an assembly line means for assembling the shock detectors, including a plurality of stations at which specific jobs are performed and moving means for moving a plurality of elements from station to successive station;

b. an inner tube loader means for loading the inner tube at an inner tube loader station;

c. sealer means for sealing a first end of inner tube when it is disposed at a sealer station;

d. inner tube inverter means for inverting said inner tube;

e. indicator emplacement means for emplacing the indicator means within the inner tube;

f. outer tube loader means for loading an outer tube at another station;

g. combining and sealing means for combining the inner tube within the outer tube so as to form the shock detector;

h. unloader means for unloading the shock detector from the assembly line means; and

i. control means for controlling the assembly line, inner tube loader means, sealer means, indicator emplacement means, outer tube loader means, combining and sealing means and unloader means with a predetermined degree of automation.

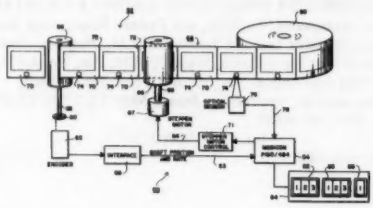
4,519,868

COMPUTER CONTROLLED LABELLING MACHINE

Wolfgang Hoffmann, 3420 Saginaw Ct., Modesto, Calif. 95355

Filed Nov. 12, 1982, Ser. No. 441,040
Int. Cl.³ G03D *15/04*; B26D *5/34*
U.S. Cl. 156—353 **4 Claims**

1. In combination, a digital data processing means, a labelling machine including a master shaft and a slave shaft, means for sensing position of said master shaft of said labelling machine operatively connected between said master shaft and said digital data processing means, an optical sensor for a registration mark for each label on a sheet of labels, said optical sensor being connected to said digital data processing means, a means for entering a length of labels on the sheet to be fed through said labelling machine, said length entering means being connected to said digital data processing means, a drive roller positioned to advance the sheet of labels in said labelling machine, a stepping motor connected between said drive roller and said digital data processing means, said digital data processing means including means responsive to inputs from said master shaft position sensing means, said registration mark optical sensor and said length entering means for providing actuating signals from the master shaft position, sensed registration mark and length inputs to said stepping motor to maintain alignment of each label in the sheet of labels relative to position of the master shaft as the sheet of labels is advanced in said labelling machine.

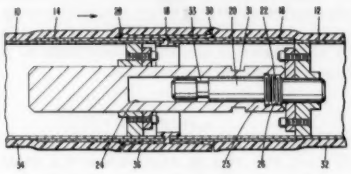


4,519,869

MANUFACTURE OF FILAMENTARY COMPOSITES

Dee R. Gill, Sandy, and Rex B. Marks, Roy, both of Utah, assignors to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 396,536, Jul. 8, 1982,. This application Feb. 28, 1982, Ser. No. 567,444
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—428 **9 Claims**



1. In a machine for producing filament wound composite tubular members, the improvement which comprises a segmented mandrel having madrel segments joined together along a common central, longitudinal axis, each of said mandrel segments comprising:

a hollow tube dimensioned suitably for each of said composite tubular members;

first and second mounts secured within said tube and respectively carrying a threaded socket and a threaded plug that, in turn, thread respectively with any of the other threaded plugs and sockets carried by the other mandrel segments of said segmented mandrel, said threaded plug and threaded socket each being of lesser diameter than said tube and having center longitudinal socket and plug axes coincident with that of said segmented mandrel;

said threaded socket having an unthreaded socket portion of somewhat less diameter than the threaded socket portion thereof, said unthreaded socket portion extending along said socket axis from such threaded socket portion inward towards a center position of said mandrel segment between said threaded socket and threaded plug;

said threaded plug having an unthreaded plug portion extending along said plug axis away from the threaded por-

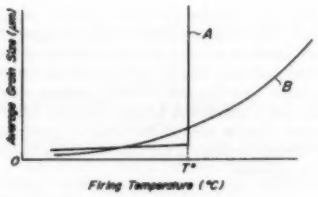
tion thereof and from said center position, said unthreaded plug portion comprising a diameter somewhat less than that of each of the unthreaded socket portions of said other mandrel segments for sliding engagment therewith during threading and unthreading engagements thereof.

4,519,870

METHOD FOR PRODUCING A SINGLE CRYSTAL

Soichiro Matsuzawa, Toyoake, and Syunzo Mase, Ama, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Division of Ser. No. 151,605, May 20, 1980, Pat. No. 4,402,787.
This application Nov. 19, 1982, Ser. No. 443,030
Claims priority, application Japan, May 31, 1979, 54-67893; Aug. 2, 1979, 54-98055
Int. Cl.³ C30B *1/10*
U.S. Cl. 156—603 **17 Claims**



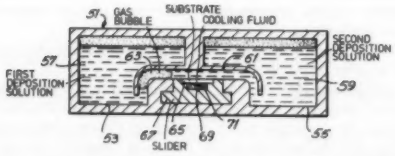
1. In a method for producing a single crystal which comprises contacting a seed single crystal to a fine grain polycrystal body having substantially the same crystal structure as the seed single crystal, and heating the contacted crystals to grow the single crystal towards the polycrystal, the improvement comprising the steps of: (a) using a polycrystal having the property which causes a discontinuous crystal grain growth in the course of heating, (b) heating the contacted crystals to grow the single crystal at a temperature (t°C.) which is lower than the temperature (T°C.) at which the discontinuous crystal grain growth is caused in the polycrystal, and (c) integrating a thickness of at least 0.25 mm of the polycrystal to the seed single crystal to grow the single crystal.

4,519,871

BUBBLE-MODE LIQUID PHASE EPITAXY

Melvin S. Cook, P.O. Box 38, Saddle River, N.J. 07458

Filed Nov. 25, 1983, Ser. No. 555,276
Int. Cl.³ C30B *19/00*
U.S. Cl. 156—622 **1 Claim**



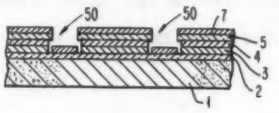
1. A method of growing epitaxial layers on a substrate located in a channel from solutions, said epitaxial layers including at least two epitaxial layers that differ in composition from each other, said solutions including at least two solutions that differ in composition from each other, comprising the steps of separating said at least two solutions by at least one gas bubble, growing said at least two epitaxial layers on said substrate in sequence by controlling sequential contact with said substrate of said at least two solutions, and moving a gas bubble across said substrate between said sequential contact with said substrate of said at least two solutions.

4,519,872

USE OF DEPOLYMERIZABLE POLYMERS IN THE FABRICATION OF LIFT-OFF STRUCTURE FOR MULTILEVEL METAL PROCESSES

Herbert R. Anderson, Jr., Patterson; Harbans S. Sachdev, and Krishna G. Sachdev, both of Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,516
Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*; B29C *17/08*
U.S. Cl. 156—643 **24 Claims**



1. A process for forming a metal pattern on a substrate which comprises:

forming a mask of at least one thermally depolymerizable polymer on the substrate with a pattern of openings complementary to the desired metal pattern;

blanket coating the substrate and the mask with a metal;

heating to thermally depolymerize the thermally depolymerizable polymer; and

thereafter immersing the resulting assembly in a solvent to lift-off the depolymerized polymer and any metal thereover leaving metal in the desired pattern on the substrate.

4,519,873

PROCESS FOR PRODUCING FIBROUS SHEET

Masahiro Amano; Shunji Seino; Ryota Nishiyama, and Masaoki Nozaki, all of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Continuation of Ser. No. 6,646, Jan. 26, 1979, abandoned. This application Feb. 9, 1983, Ser. No. 465,191
Claims priority, application Japan, Feb. 9, 1978, 53-13873
Int. Cl.³ D21H *5/12*
U.S. Cl. 162—138 **11 Claims**

1. A process for producing an electrical insulating thin paper consisting essentially of pulp-like particles of an aromatic polyamide or an aromatic polyamide-imide, said process comprising the steps of:

(1) forming a web from an aqueous slurry of pulp-like particles of an aromatic polyamide or an aromatic polyamide-imide

prepared by precipitating the polyamide or polyamide-imide from a solution thereof in a concentration of at most 20% in a single solvent therefore,

said particles having a freeness of 80 ml or less as expressed by Canadian Standard Freeness,

(2) drying the said web, and then

(3) pressing said web thereby densifying same to make the web's dielectric breakdown strength at least 60 KV/mm.

4,519,874

PROCESS FOR RECOVERING CARBONACEOUS AND SULFUR-CONTAINING PARTICLES FROM A RETORT

Rick V. Bertram, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed Apr. 14, 1983, Ser. No. 484,982
Int. Cl.³ C10B *33/00, 39/04*; C10G *1/00*
U.S. Cl. 201—39 **18 Claims**

1. A process for depressurizing retorted particles removed from a retort, said process comprising:

(1) removing said particles containing carbonaceous components and sulfur components from the retort and passing them as a particle bed through a cooling zone;

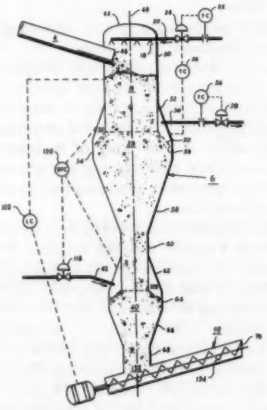
(2) cooling the particles with water directed into said cooling

zone so as to generate a produced gas comprising steam and hydrogen sulfide while cooling said particles;

(3) recovering a first portion of said produced gas generated in step (2) from a gas disengaging zone while said particles pass through said gas disengaging zone;

(4) transferring a second portion of said produced gas co-currently with said particles into a surge zone while undergoing accompanying substantial pressure drop, said particles during transfer being maintained as a continuous bed offering substantial pressure drop resistance;

(5) removing from a surge zone said second portion of the produced gas together with a commingled first portion of a sealing gas from step (6) while said particle bed passes from the surge zone into a gas injection zone;



(6) injecting sealing gas into the particles bed in said gas injection zone, said sealing gas dividing into at least a first and a second portion, the first portion passing countercurrently to the particles into said surge zone and commingling therein with the second portion of the produced gas, and the second portion passing co-currently with the particles out of the gas injection zone;

(7) transferring the particles and the second portion of the sealing gas from said gas injection zone to a location for discharge while undergoing a pressure drop, said particles during transfer being maintained as a continuous bed offering pressure drop resistance; and

(8) discharging the particles and said second portion of the sealing gas.

4,519,875

PURIFICATION OF ETHYLENE GLYCOL DERIVED FROM ETHYLENE CARBONATE

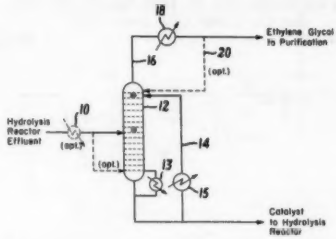
Mitchell Becker, Teaneck, N.J., and Howard M. Sachs, Riverdale, N.Y., assignors to The Halcon SD Group, Inc., New York, N.Y.

Filed May 9, 1984, Ser. No. 608,639
Int. Cl.[3] B01D *3/34*
U.S. Cl. 203—28 **5 Claims**

1. A process for reducing the ethylene carbonate content of ethylene glycol produced by hydrolysis of ethylene carbonate in the presence of a catalyst comprising:

(a) distilling in a vapor-liquid contacting means the effluent of said hydrolysis comprising ethylene glycol, higher glycols, catalyst, unreacted water, and unreacted ethylene carbonate and withdrawing as a lower-boiling fraction a vapor stream comprising substantially only ethylene glycol and water and as a higher-boiling fraction a liquid stream comprising substantially only hydrolysis catalyst, ethylene glycol, and higher glycols;

(b) recirculating a sufficient amount of said liquid higher-boiling fraction of (a) through said vapor-liquid contacting means as reflux against said vapor lower-boiling fraction of (a) to essentially complete the hydrolysis of ethylene carbonate to reduce the ethylene carbonate content of



said withdrawn lower-boiling fraction to below about 0.05 wt. percent;

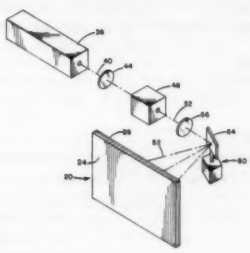
(c) recirculating the remaining portion of said higher-boiling fraction to said hydrolysis reaction.

4,519,876

ELECTROLYTIC DEPOSITION OF METALS ON LASER-CONDITIONED SURFACES

Chung H. Lee, Reading; John Fronduto, Waltham, and Peter E. Oettinger, Acton, all of Mass., assignors to Thermo Electron Corporation, Waltham, Mass.

Filed Jun. 28, 1984, Ser. No. 625,765
Int. Cl.[3] C25D *5/02*
U.S. Cl. 204—15 **15 Claims**



1. A method of depositing a metal on spatially selected regions of a workpiece comprising the following steps in the order given:

providing a workpiece having an electrically conductive substrate and an electrically insulative surface layer,

irradiating the surface layer in said selected regions of said workpiece with laser energy to fracture portions of said surface layer in said regions, thereby providing in said regions a path to the substrate along which electric current may flow upon immersion of the workpiece into an electrolyte; and

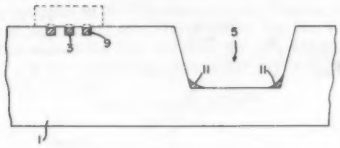
immersing said workpiece in an electrolytic plating bath and applying a negative electrical bias to said substrate to electrolytically deposit a coating of said metal onto said selected regions.

4,519,877

FORMATION OF NARROW CONDUCTIVE PATHS ON A SUBSTRATE

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particle Technology Corporation, Camarillo, Calif.

Division of Ser. No. 447,159, Dec. 6, 1982, Pat. No. 4,510,347.
This application Oct. 26, 1984, Ser. No. 665,535
Int. Cl.[3] C25D 5/02, 5/48, 5/50
U.S. Cl. 204—15 20 Claims



1. A method of forming material paths in grooves of predetermined width formed in a substrate surface, comprising the steps of:

(a) providing a substrate with a surface and grooves of predetermined width in said surface having exposed walls,

(b) building up on all exposed surfaces of said substrate including the exposed walls of said grooves, substantially uniformly, in directions substantially normal to said exposed surfaces, a layer of predetermined deplatable material having a thickness at least about one third the width of said grooves to fill said grooves with said deplatable material and form deplatable material over said grooves extending above said surface, and

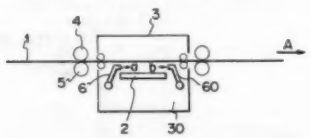
(c) deplating said layer substantially uniformly in a direction normal to the exposed surface of said layer until substantially all of said layer is removed from said substrate surface whereby said layer is retained substantially only in said grooves.

4,519,878

METHOD OF FE-ZN ALLOY ELECTROPLATING

Tomihiro Hara; Takeshi Adaniya, both of Yokohama, and Akira Tonouchi, Tokyo, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 11, 1983, Ser. No. 483,564
Claims priority, application Japan, Apr. 14, 1982, 57-61112
Int. Cl.[3] C25D 7/06, 5/10
U.S. Cl. 204—28 1 Claim



1. A method of electroplating a steel sheet surface with at least two Fe-Zn alloy layers of different compositions; wherein said steel sheet is continuously moved horizontally through two or more chambers having anodes and plating baths therein, the composition of the baths in the different chambers, being substantially the same and also having means for applying a jet flow of said plating baths against said sheet surface while concurrently moving said sheet; and wherein the relative speed between said jet flow of said plating baths and movement of said sheet is selectively controlled to be from 0.3 to 3.0 m/sec, and current applied to said anodes is selectively controlled to provide a current density of between 10 to 100 A/dm^2; whereby a first layer of Fe-Zn alloy is formed on said steel sheet surface having a Fe content of between 3 to 30 weight percent, and a second layer of Fe-Zn alloy is formed on said first layer having a Fe content of between 15 to 60 weight percent, the differences in compositions of said layers being achieved by the selective varying of said relative speed and said current density without substantially changing the composition of the plating baths.

4,519,879

METHOD OF PRODUCING TIN-FREE STEEL SHEETS

Toshio Ichida; Hideo Kobayashi; Hajime Ogata, and Shunichi Tsugawa, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Hyogo, Japan

Filed May 26, 1983, Ser. No. 498,548
Claims priority, application Japan, Jun. 1, 1982, 57-93414
Int. Cl.[3] C25D 5/00, 5/48
U.S. Cl. 204—35.1 2 Claims

1. A method of producing a tin-free steel sheet having improved retorting resistance, comprising:

chromium plating a steel sheet through cathodic electrolysis in a chromium ion-containing first aqueous solution that contains sulfur, to form a plating of metallic chromium with a superposed layer of hydrated chromium oxides,

reducing the sulfur in said layer of hydrated chromium oxides by reversely electrolyzing the chromium plated steel sheet by a successive anodizing treatment in the same said aqueous solution, and

subjecting the reversely electrolyzed steel sheet to cathodic electrolysis in a second aqueous solution of at least one member selected from the group consisting of chromic acid, chromates, and dichromates, said second aqueous solution containing substantially less sulfur than said first aqueous solution, until a layer of hydrated chromium oxides of substantial thickness has added to the layer of hydrated chromium oxides remaining after said reverse electrolyzing and the total quantity of hydrated chromium oxides is 5 to 30 mg in terms of metallic chromium per square meter of the surface,

said chromium plating and reverse electrolysis being carried out so as to satisfy the equations

$$x+1 \leqq y \leqq x+4$$

$$1 \leqq x \leqq 6$$

where y and x are the quantities of hydrated chromium oxides present on one surface of the steel sheet after the chromium plating step and after the reverse electrolysis step, respectively, as expressed in mg of metallic chromium per square meter of the surface.

4,519,880

PROCESSES FOR THE RECOVERY OF CYANIDE FROM AQUEOUS THIOCYANATE SOLUTIONS AND DETOXICATION OF AQUEOUS THIOCYANATE SOLUTIONS

John J. Byerley, 154 Chelford Crescent, Waterloo, Ontario, Canada (N2J 3T5), and Kurt Enns, 345 Dale Crescent, Waterloo, Ontario, Canada (N2J 3Y6)

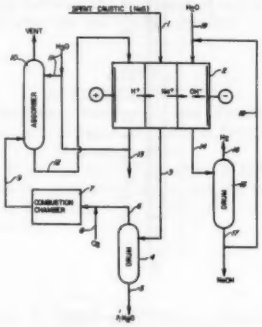
Division of Ser. No. 416,239, Sep. 9, 1982,. This application Oct. 7, 1983, Ser. No. 540,520
Int. Cl.[3] C25B 1/00, 1/14, 1/22
U.S. Cl. 204—91 4 Claims

1. A process for electrochemically oxidizing thiocyanate, said process comprising introducing an aqueous solution containing thiocyanate ions into a suitable electrochemical reactor, applying a direct current electrical potential to said reactor to convert the thiocyanate ions to relatively harmless reaction products while maintaining the pH of the solution in a range from 10 to 12.

4,519,881
REGENERATION OF ALKALINE TREATING AGENTS

Yuehsiung Chang, Naperville, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 25, 1984, Ser. No. 623,944
Int. Cl.[3] C02C 5/12; C25B 1/20
U.S. Cl. 204—149 5 Claims



1. A process for regenerating aqueous caustic from aqueous sulfidic waste liquor containing alkali metal sulfides which comprises: (a) feeding said aqueous waste liquor to a feed receiving compartment of a three compartment electrolysis cell comprising an anolyte compartment formed by an anode and a first cation permeable membrane in which said anolyte is an aqueous solution of sulfuric acid and sulfur dioxide, a feed receiving compartment formed by said first cation permeable membrane and a second cation permeable membrane, and a catholyte compartment formed by said second cation permeable membrane and a cathode in which the catholyte is an aqueous solution of sodium hydroxide, (b) subjecting said aqueous sulfidic waste liquor to electrolysis whereby the effluent from said anolyte compartment is aqueous sulfuric acid, the effluent from said feed compartment is hydrogen sulfide and a spent aqueous solution of alkali metal sulfides, and the effluent from said catholyte compartment is hydrogen and regenerated sodium hydroxide in aqueous solution, and (c) oxidizing said hydrogen sulfide in a combustion zone in the presence of oxygen to sulfur dioxide, (d) absorbing said sulfur dioxide in aqueous sulfurous acid and sulfuric acid, and (e) oxidizing said sulfur dioxide and said sulfurous acid to sulfuric acid in said anolyte compartment.

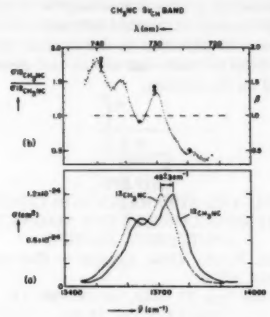
4,519,882
ISOTOPE SEPARATION BY LASER EXCITATION OF UNIMOLECULAR REACTANTS

Kammalathinna V. Reddy, Parsippany, and Michael J. Berry, Chatham, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jun. 27, 1979, Ser. No. 52,384
Int. Cl.[3] B01D 59/01
U.S. Cl. 204—158 R 3 Claims

1. A process for producing isotopically enriched material which comprises:

(a) exposing a gaseous composition comprising a particular isotope of an element and at least one other isotope of the same element, said isotopes being bound to hydrogen in a polyatomic molecule, to laser radiation of a predetermined wavelength in the range from about 400 nm to about 1000 nm, which radiation, by direct one-photon excitation, preferentially excites molecules containing said particular isotope of said element to an excited vibrational state of the ground electronic state, thereby converting said excited molecules by photofragmentation to a form in which they may be separated from the nonexcited molecules; and



(b) separating said converted molecules from said nonexcited molecules.

4,519,883
SENSITIZATION OF GLYOXYLATE PHOTOINITIATORS USING A TERPHENYL COMPOUND

Francis A. Via, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Dobbs Ferry, N.Y.

Filed Jun. 6, 1983, Ser. No. 501,470
Int. Cl.[3] C08F 2/50
U.S. Cl. 204—159.15 14 Claims

1. In the photopolymerization of monomeric and polymeric compositions of photopolymerizable substances wherein a photoinitiator is admixed with a photopolymerizable composition and the mixture exposed to actinic radiation, the improvement wherein photopolymerization is effectively initiated by a glyoxylate photoinitiator in the presence of a terphenyl compound sensitizer for said photoinitiator.

4,519,884
CATHODIC ELECTRODEPOSITION OF CHARGED AQUEOUS POWDER SLURRY

Robert J. Ritchie, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 29, 1982, Ser. No. 427,478
Int. Cl.[3] C25D 13/06, 13/10; B05D 7/26
U.S. Cl. 204—181 C 10 Claims

1. A process for the preparation of an aqueous coating bath to be used in an electro-deposition process wherein aqueous powder slurry of particles of polymer powder having an average particle size measured optically of not more than about 20 μm is mixed with a solution of metal salt which can convert to amphoteric metal oxide or hydroxide at a pH and temperature at which said precipitation does not occur, and then the pH and/or temperature is raised to a level which causes precipitation of such amphoteric metal oxide or hydroxide onto said particles of polymer powder.

2. An electrocoating process for the deposition of paint on a cathodic surface wherein an aqueous coating bath prepared by the process of claim 1 containing said paint is provided with a positively charged anode and with a negatively charged cathode which is to be coated with said paint,

the solids content of said paint consisting essentially of particles of a polymer powder having an average particle size measured optically of not more than about 20 μm, said particles being coated with amphoteric metal oxide or hydroxide precipitated or absorbed thereon in an amount sufficient to cause said particles to migrate toward said cathode under the influence of said charge,

the pH of said bath being in a range below the isoelectric

point such that the zeta potential of said coated particles is at least about 35 millivolts,

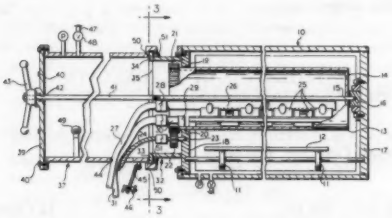
said electrocoating process comprising the steps of applying a voltage between said anode and said cathode to cause said paint to be deposited on the cathode, separating the cathode from the bath, and drying and curing the paint deposited on the cathode.

4,519,885

METHOD AND APPARATUS FOR CHANGING SPUTTERING TARGETS IN A MAGNETRON SPUTTERING SYSTEM

David T. Innis, Toledo, Ohio, assignor to Shatterproof Glass Corp., Detroit, Mich.

Filed Dec. 27, 1983, Ser. No. 565,322
Int. Cl.³ C23C *15/00*
U.S. Cl. 204—192 R **7 Claims**



1. The method of changing sputtering targets in a magnetron sputtering system wherein a cylindrical magnetron having a closed end extends into a sputtering chamber through one wall thereof, comprising the steps of withdrawing the depleted or old target from the sputtering chamber into a first receiving chamber that is pumped down to a preselected vacuum and which overlays an opening in the sputtering chamber corresponding to the target location, moving the receiving chamber out of alignment with the target location while simultaneously moving a new target enclosed in a second evacuated receiving chamber into alignment with the target location and transferring the new target through the wall into sputtering position in the sputtering chamber.

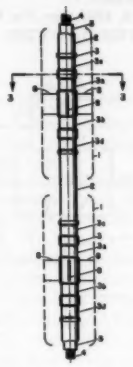
4,519,886

METHOD OF MAKING ELECTRICAL CONNECTION TO AN ANODE

Oronzio de Nora, and Giuseppe Bianchi, both of Milan, Italy, assignors to Oronzio de Nora, S.A., Lugano, Switzerland

Continuation of Ser. No. 452,268, Dec. 21, 1982. This application Jan. 25, 1984, Ser. No. 573,732
Claims priority, application Italy, Jan. 21, 1982, 19208 A/82
The portion of the term of this patent subsequent to Jun. 5, 2001, has been disclaimed.
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—196 **3 Claims**

1. The method of making the electrical connection between a valve metal anode having a conductive core and a flexible power supply cable insulated by a sheath of elastomeric material and having a certain length of exposed conductive core which comprises introducing the supply cable into at least one valve metal cylindrical sleeve which forms part of the said anode, reducing the circumference of said sleeve by squeezing said valve metal sleeve a first time over the exposed conductive core of the power supply cable corresponding to said certain length to provide the electrical connection, and subsequently directed over the insulating sheath of elastomeric



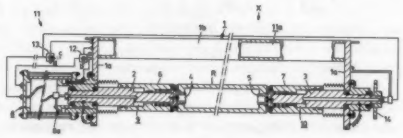
material of the cable to provide a leakproof sealing of the electrical connection.

4,519,887

APPARATUS FOR AUTOMATICALLY ATTACHING AND DETACHING CASSETTE-TYPE ROLLS

Tatsuo Shigeta, Nagareyama, Japan, assignor to Think Laboratory Co., Ltd., Chiba, Japan

Filed Jun. 13, 1983, Ser. No. 503,841
Int. Cl.³ C25D *17/06*
U.S. Cl. 204—212 **1 Claim**



1. In an apparatus for automatically attaching and detaching cassette-type rolls having a shaft, comprising:

a hanging frame;

a pair of rotatable spindles which are provided in an opposing manner on both sides of the hanging frame;

a pair of current-carrying means which are provided at the ends of the spindles to support a roll that is to be treated between the spindles, said current-carrying means being capable of flowing electric current;

a pair of leak-proof cups which are annularly provided on the outer side of the current-carrying means, and which so move as to come into contact with the end surfaces of the roll to prevent the processing liquid from entering into the side of the current-carrying supporters;

an air cylinder unit which is mounted on the hanging frame and which moves at least one of said spindles in the axial directions;

air cylinder chambers which are formed between said spindles and said leak-proof caps, and which drive, by the compressed air, the leak-proof caps to come into contact with the end surfaces of said roll; and

compressed air supply means which has a compressed air tank to supply the compressed air to said air cylinder unit and to said air cylinder chambers;

the improvement wherein;

said current-carrying means comprises replaceable current-carrying supporters which are selected depending upon the type of the roll and possess shaft-engaging portions which

engage with and support the shaft portion of said roll, and spindle-engaging portions which are engaged with and supported by said spindles; and

said leak-proof caps comprise moving caps fitted to the outer side of said spindles and moved by the compressed air supplied to said air cylinder chambers, and replaceable exchange caps which are selected depending upon the type of the roll and maintain air-tightness around the periphery of said spindles between the moving caps and the end surfaces of the roll when the roll is to be chucked.

4,519,888

ELECTROLYTIC CELL

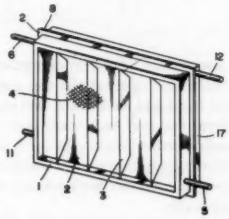
Michihiro Akazawa, Shinnanyo, and Nobuhiro Kawasaki, Yamaguchi, both of Japan, assignors to Toyo Soda Manufacturing Co., Ltd., Shinnanyo, Japan

Filed Jan. 18, 1984, Ser. No. 571,884

Claims priority, application Japan, Jan. 19, 1983, 58-5827

Int. Cl.³ C25B *9/00, 11/03, 11/10, 11/04*

U.S. Cl. 204—252 **3 Claims**



1. An electrolytic cell used to electrolyze an aqueous solution of alkali chloride which comprises an anode chamber and a cathode chamber divided by a partition, and employing a cation exchange membrane as a diaphragm, and

(a) an anode or a cathode in the anode chamber and cathode chamber respectively, each being a porous electrode having an opening ratio of 30 to 70% and a thickness of 0.1 to 1 mm, and the shortest distance from the circumference of a opening which forms one pore in the porous electrode, to that of a nearest adjacent pore opening, being less than 5 mm, and

(b) said partition having a thickness of less than 6 mm to separate the anode chamber from the cathode chamber, the portion of the partition on the side of the anode chamber and the portion on the side of the cathode chamber, being joined through a wavy seam weld, and the distance from the surface of said electrodes to the surface of said partition being within the range of 10 to 25 mm,

(c) and further comprising ribs joining the electrodes with the partition, and

(d) said porous electrode being partly divided in the neighborhood of the center between a rib and another rib, and the angle formed by the surface of the electrode, extended from the rib to both sides against the surface of the membrane, is less than 180° C.

4,519,889

HALOGENATION APPARATUS

Alberto Pellegri, Luino, Italy, and Placido M. Spaziante, Lugaono, Switzerland, assignors to Oronzio deNora Impianti Elettrochimici S.p.A., Milan, Italy

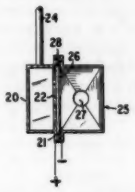
Continuation of Ser. No. 40,459, May 18, 1979, abandoned, which is a division of Ser. No. 929,494, Jul. 31, 1978, Pat. No. 4,172,773. This application May 24, 1983, Ser. No. 497,669

Claims priority, application Italy, May 11, 1978, 23283 A/78

Int. Cl.³ C25B *9/00, 11/03, 11/06, 11/10*

U.S. Cl. 204—275 **6 Claims**

1. A diaphragmless electrolysis cell comprising a first compartment containing both a porous, permeable anode and a cathode, said anode being electrochemically active over the surface directly opposing the cathode and forming an interelectrode gap therebetween, a second compartment separated from the first compartment by the porous permeable anode, means for circulating an electrolyte through the second compartment, means for circulating a second electrolyte through



the interelectrodic gap of the first compartment, means for maintaining a constant hydrostatic pressure differential between the two compartments to effect flow of electrolyte from the second compartment to the anode through the said porous anode surface and means for impressing an electrolysis current between the said cathode and anode.

4,519,890

FLOW SYSTEM GLASS ELECTRODE

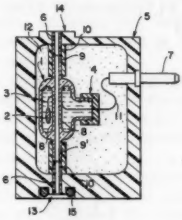
Hiroaki Uematsu; Junji Aoki, and Narihiro Oku, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed May 24, 1984, Ser. No. 614,225

Claims priority, application Japan, Jun. 7, 1983, 58-87294[U]

Int. Cl.³ G01N *27/36*

U.S. Cl. 204—409 **3 Claims**



1. A flow system glass electrode characterized in that the flow system glass electrode body, which is provided with a response film along an internal flow conduit and seals an internal electrode and an internal liquid by a packing, is contained in a resin block, sample flow tubes each equal in an inner diameter to said response film and at the entrance and exit sides are inserted into the walls of said resin walls respectively, said sample flow tubes are connected with a liquid inlet and a liquid outlet at the glass electrode body side by use of couplings respectively, and a space within said resin block except for said glass electrode body is filled with a filler of electrical insulating property.

4,519,891

LIQUID FILM TYPE, ANION-SELECTIVE ELECTRODE

Kenshi Sugahara; Kazuo Yasuda, both of Katsuta, and Junji Mori, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 27, 1984, Ser. No. 574,587

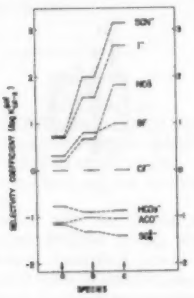
Claims priority, application Japan, Jan. 28, 1983, 58-13065

Int. Cl.³ G01N *27/30*

U.S. Cl. 204—418 **28 Claims**

25. A liquid film type, anion-selective electrode comprising a sensitive film containing polymer resin as a support film

material, a quaternary ammonium salt or a quaternary phosphonium salt as an anion-sensitive substance, a linear alcohol having a low dielectric constant, and an organic compound having a dielectric constant higher than that of said linear alcohol, the linear alcohol and organic compound having



dielectric constants, and being contained in the film in amounts, effective such that deposition of proteins on said sensitive film is reduced, as compared to a film containing no linear alcohol, while providing for dissolving of the anion-sensitive substance.

4,519,892

FIREMEN'S TOOL MOUNTING ASSEMBLY

Gerald A. Blakeslee, Milton, Del., assignor to Gerald A. Blakeslee, Jr., Milton, Del.

Filed May 11, 1984, Ser. No. 609,138

Int. Cl.³ B65D *69/00, 85/02, 85/20*

U.S. Cl. 206—223 **6 Claims**

1. A firemen's tool assembly and mounting comprising a vertically disposed stationary mounting bracket having a pair of vertically aligned and spaced upturned support elements, and an assembly of essential firemen's tools bodily supportable on said mounting bracket and being readily liftable therefrom by hand, and said tool assembly comprising a substantially vertical axis sleeve formed by the interconnection of male and female threaded hose adapters, and a plurality of separate wrenches each having handles insertable downwardly through the bore of said sleeve and each having enlarged heads disposed above the upper end of said sleeve and being of sizes whereby said heads cannot pass downwardly through the bore of said sleeve, and the tool assembly being supportively engaged with the mounting bracket by having the lower upturned support element on the mounting bracket engaged upwardly through the bottom of the sleeve and the top upturned support element engaged with the head of one of said wrenches, whereby the tool assembly is supported at two points along its vertical length.

4,519,893

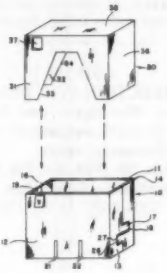
MAGNETIC DISC STORAGE CONTAINER

Richard J. Olas, Crystal Lake, Ill., assignor to KoMac Enterprises, Inc., Crystal Lake, Ill.

Filed Jul. 7, 1983, Ser. No. 511,408

Int. Cl.³ B65D *85/30*

U.S. Cl. 206—311 **13 Claims**



1. A magnetic disc storage container comprising: a rectangular shaped disc receptacle open at the top and comprising a rectangular shaped front and back wall; two end walls joining the ends of said front and said back walls, said end walls each cut in a corresponding central region for the full height of each said end wall permitting separation of two portions of each end wall; and a rectangular bottom wall joining said front, said back, and said end walls;

a cover-holder open at the bottom and comprising a front wall and a back wall; two solid end walls joining the ends of said front and said back walls; and a solid rectangular top wall joining said front, said back and said end walls; each said front and back wall having an inverted truncated V-shaped cutout open to the bottom and the width of the central leg joining portion of said truncated V corresponding to the width of said disc receptacle end walls and spaced from the top of said cover holder, said inverted truncated V-shaped cutouts aligned with each other;

said disc receptacle front and back walls having open parallel slots extending perpendicularly upwardly from the bottom the distance said central leg portion of said inverted truncated V is spaced from said top of said cover-holder, said slots spaced apart the width of said cover-holder end walls; and

said disc receptacle bottom wall having open slots joining said front and back wall open slots and having a solid hinge means parallel to and in the region of each disc receptacle front and back wall providing a closed hingedly flexible bottom with only said slots open.

4,519,894

TREATMENT OF CARBONACEOUS SHALES OR SANDS TO RECOVER OIL AND PURE CARBON AS PRODUCTS

David G. Walker, 904 Fleetwood Dr., Baytown, Tex. 77520

Continuation-in-part of Ser. No. 554,066, Nov. 2, 1983, abandoned. This application Aug. 17, 1984, Ser. No. 641,875

Int. Cl.³ C10G *1/00, 1/04*

U.S. Cl. 208—11 R **2 Claims**

1. A process for the production of oil, pure carbon (tar, sulfur and ash-free) and producer gas from carbon-containing solids which comprises:

(a) passing the said solid from the top to the bottom of a vertical shaft which is divided into six stages;

(b) passing an inert gas across the sixth stage (bottom) of the vertical shaft and then across the first stage (top);

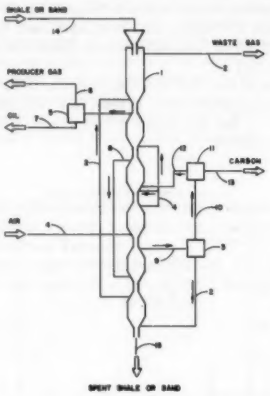
(c) passing air across the fourth stage of the said shaft and

then feeding the said air in part to the second stage and in part to the third stage of the said shaft;

(d) separating the gas product of the second stage into oil and a producer gas;

(e) feeding the gas product of the third stage through the fifth stage of the said shaft and then into a carbon monoxide separation unit;

(f) using the inert gas produced in the carbon monoxide separation unit as feed to the sixth stage of the said shaft;



(g) feeding the pure carbon monoxide product of the carbon monoxide separation unit to a Boudouard reactor;

(h) reacting carbon monoxide to carbon dioxide and carbon;

(i) separating the carbon from the carbon dioxide;

(j) feeding the carbon dioxide to the third stage of the said shaft; and

(k) discarding the treated solid from the bottom (sixth) stage of the said shaft.

4,519,895

PROCESS FOR CONVERTING A CARBONACEOUS MATERIAL TO LOWER PARAFFINIC HYDROCARBONS AND MONOCYCLIC AROMATIC HYDROCARBONS

André Deschamps, Noisy le Roi, and Sigismond Franckowiak, Rueil-Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Nov. 23, 1982, Ser. No. 444,016

Claims priority, application France, Nov. 23, 1981, 81 22018

Int. Cl.³ C10G *1/00, 1/06*

U.S. Cl. 208—8 LE **15 Claims**

1. A process for converting a solid carbonaceous material to lower paraffinic hydrocarbons and monocyclic aromatic hydrocarbons, comprising the steps of:

(a) admixing the carbonaceous material with a hydrogenated recycle oil, having an atomic ratio H/C of at least 1/1, obtained from step (e), and maintaining the resultant mixture in contact with a hydrogen-containing gas at a temperature from 350° to 470° C., for at least 5 minutes, under a hydrogen partial pressure of at least 20 bars;

(b) contacting the effluent from step (a) without separation with a hydrogen-containing reducing gas for 0.1 to 60 seconds, at a temperature from 600° to 1000° C., under a pressure of at least 20 bars, said reducing gas being produced at least partly in step (d) and being introduced at a temperature of at least 900° C.;

(c) fractionating the product of step (b), and separately recovering (i) at least one fraction of carbonaceous solid residue, (ii) at least one fraction of lower paraffinic hydrocarbons and monocyclic aromatic hydrocarbons normally distilling, at least in major part, below 150° C., and (iii) at least one hydrocarbon fraction normally distilling, at least in major part, above 150° C.;

(d) treating the carbonaceous solid residue fraction (i) with oxygen and steam, under conditions of carbon oxyvapogasification, to convert at least a portion thereof to a hydrogen containing reducing gas, and feeding at least a portion of said reducing gas to step (b);

(e) contacting hydrocarbon fraction (iii) from step (c) with hydrogen, in the presence of a hydrogenation catalyst, under hydrogenation conditions, until an atomic ratio H/C of the hydrocarbons of said fraction of at least 1/1 is obtained, and feeding at least a portion of the resultant hydrogenated hydrocarbon fraction back to step (a) as said hydrogenated recycle oil.

4,519,896

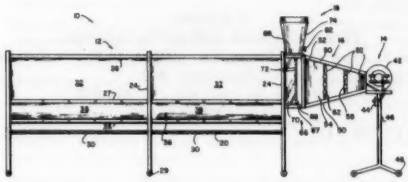
DRY MATERIAL SORTING DEVICE

James D. Vickery, 531 Lindsey Rd., Golden, Colo. 80401

Filed Mar. 11, 1982, Ser. No. 357,142

Int. Cl.³ B07B *9/02*

U.S. Cl. 209—44.1 **17 Claims**



17. A granular material sorting device for sorting dry material mixtures including relatively low density particles and relatively high density particles, such as sand and gold of mixed particle sizes comprising:

granular material sizing means for segregating the granular material into batches wherein the maximum to minimum diameter of particles in any batch is a preselected ratio dependent on the ratio of specific gravities of the different materials to be sorted;

horizontally disposed transversely unrestricted wind tunnel means of substantially constant and uniform cross section throughout the length thereof for directing a horizontal airflow therethrough of relatively constant velocity from top to bottom and upstream end to downstream end of said wind tunnel means, said horizontally disposed wind tunnel having an open bottom portion;

air forcing means for inducing said relatively constant velocity horizontal airflow through said wind tunnel means;

granular material injection means for free fallingly injecting said sizingly sorted granular material mixture into said wind tunnel means proximate the upstream end thereof and proximate the top thereof in a stream extending across said wind tunnel means and having a stream dimension measured longitudinally of said horizontal airflow sufficiently small to prevent piggybacking of particles exposed to said horizontal airflow whereby substantially all said particles are directly acted on by said airflow during the period of vertical free fall of said granular particles from the top to the bottom opening of said wind tunnel means;

exit means operably mounted at the bottom of said tunnel means in fluid communication therewith, said exit means comprising a relatively narrow longitudinally extending opening therein for discharge of particles therefrom, said exit means comprising relatively low velocity airflow interface means between said wind tunnel horizontal airflow and the atmosphere;

collection means positioned below said exit means for collecting granular material falling from said exit means;

whereby said granular material is sorted into its different

component materials, the higher density particles such as gold particles falling into said collection means at a relatively upstream portion thereof, the lower density particles such as sand particles falling into said collection means at a relatively downstream portion thereof.

4,519,897

FLUID CRACKING PROCESS USING SEPIOLITE-CONTAINING CATALYST COMPOSITION

Jan I. De Jong, Blaricum, Netherlands, assignor to AKZO nv, Arnhem, Netherlands

Filed Dec. 20, 1983, Ser. No. 563,475

Claims priority, application Netherlands, Dec. 27, 1982, 8205007

Int. Cl.³ C10G *11/05, 55/06*

U.S. Cl. 208—74 **13 Claims**

1. A process for fluid catalytic cracking metal-containing petrolum feed in the presence of a fluid cracking catalyst comprising contacting the feed at fluid catalytic cracking conditions with a catalyst comprising a zeolitic crystalline aluminosilicate, sepiolite and a martix material, wherein the sepiolite is present in non-dispersed form.

4,519,898

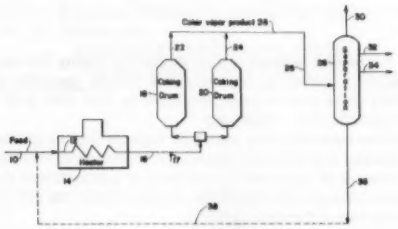
LOW SEVERITY DELAYED COKING

David E. Allan, Baton Rouge, La., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed May 20, 1983, Ser. No. 496,570

Int. Cl.³ C10G *9/14*

U.S. Cl. 208—131 **8 Claims**



1. In a delayed coking process which comprises the steps of:
(a) preheating a hydrocarbonaceous oil feed to a coking temperature, and
(b) introducing the resulting preheated oil into a coking drum operated at delayed coking conditions to form coke and a vapor phase product,
the improvement which comprises: said oil feed being preheated to a temperature ranging from about 775° to 920° F., and introducing a gas into said coking drum during step (b), in an amount ranging from about 10 to about 20 weight percent of said preheated oil to maintain the content of volatile matter of said coke in the range of about 5 to about 15 weight percent.

4,519,899

PURIFICATION OF OIL USING A JET PUMP MIXER

Jakob Oertle, Winterthur, and Bruno Mülhaupt, Schlieren, both of Switzerland, assignors to Sulzer-Escher Wyss Ltd., Zurich, Switzerland

Filed Nov. 22, 1983, Ser. No. 554,453

Claims priority, application Switzerland, Dec. 13, 1982, 7232/82

Int. Cl.³ C10M *11/00;* **B01D** *21/01*

U.S. Cl. 208—179 **8 Claims**

1. A method of purifying oil containing metal particles comprising adding to the oil a coagulating agent which forms coagulates with the metal particles; mixing the oil and agent in a mixing means including a static dispersion device, a jet pump coupled to the outlet from the dispersing device, and a recycling loop which utilizes the suction of the jet pump itself to recirculate a portion of the mixture from the outlet to the suction inlet of the jet pump; and separating coagulates formed with the agent and metal particles from the mixture to thereby produce purified oil.

4,519,900

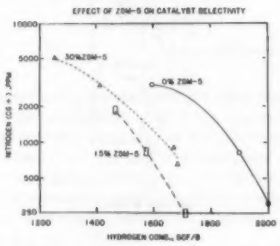
ZEOLITE CONTAINING CATALYST SUPPORT FOR DENITROGENATION OF OIL FEEDSTOCKS

Philip J. Angevine, West Deptford; Stephen M. Oleck, Moorestown; Robert C. Wilson, Jr., Woodbury, and Sadi Mizrahi, Cherry Hill, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 453,969, Dec. 28, 1982, abandoned. This application Mar. 2, 1984, Ser. No. 583,807

Int. Cl.³ C10G *45/00, 45/12*

U.S. Cl. 208—254 H **13 Claims**



1. A process for the catalytic denitrogenation of shale oil, said process consisting essentially of contacting a mixture of hydrogen and said shale oil at a hydrogen pressure of from about 500 to 3000 psig., a temperature of from about 600° to 850° F. and a space velocity of from about 0.1 to 5.0 LHSV with a catalyst consisting essentially of 5–30 wt. % of a zeolite selected from group consisting of zeolite Beta, ZSM-5, ZSM-11, ZSM-12, ZSM-23, ZSM-35, ZSM-38 and ZSM-48, 95–70 wt. % of alumina, based on alumina plus zeolite, and an active hydrogenation component.

4,519,901

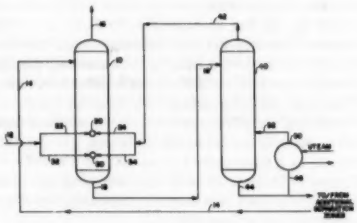
EXTRACTIVE SEPARATION PROCESS

Robert J. Flocco, Summit, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 332,194, Dec. 18, 1981, abandoned. This application Oct. 5, 1983, Ser. No. 539,122

Int. Cl.³ C10G *21/00*

U.S. Cl. 208—321 **12 Claims**



1. In an extractive separation of the type wherein:
A. an inlet feed stream having an aromatic component selected from the group consisting of benzene, toluene,

xylene, or mixtures thereof, component and a non-aromatic component is directed into an extraction zone;

B. a solvent selectively miscible with one of said aromatic components is directed into the extraction zone at a spaced apart location from the point of addition of the feed stream;

C. the feed stream and solvent stream pass substantially countercurrently through the extraction zone to produce an extract product stream relatively rich in the aromatic component and a raffinate product stream relatively rich in the non-aromatic component; and

D. a separate recycle stream produced by subsequent processing of at least one of the extraction zone product streams is returned to the extraction zone, the improvement comprising the addition of at least a fraction of the recycle stream containing substantially all of the non-aromatic component of the extract product stream to the extraction zone at a location above the location at which all the feed is added to the extraction zone.

4,519,902

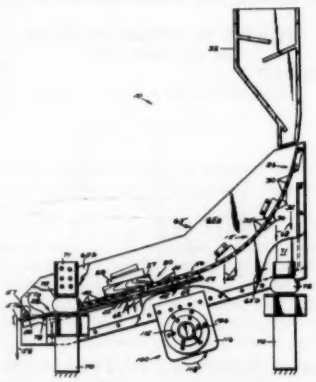
VIBRATING SCREENING APPARATUS

Greever C. Kinder, North Tazewell, Va., assignor to Clinch River Corporation, Tazewell, Va.

Continuation-in-part of Ser. No. 373,645, Apr. 30, 1982, abandoned. This application Apr. 4, 1983, Ser. No. 481,902

Int. Cl.³ B07B 9/00

U.S. Cl. 209—234 **21 Claims**



1. A vibratory screening apparatus comprising:

feeding means for feeding a layer formation flow of a dilute slurry mixture of particles and liquid;

a screen deck defining a generally unitary surface having a feed end adapted for receiving said dilute slurry mixture and a discharge end for discharging a substantially concentrated slurry mixture thereover, said feed and discharge ends defining therebetween a vector flow path along which said slurry mixture will flow as it continuously moves from said feed end to said discharge end, said screen deck including downstream from said feed end an initial sieve bend portion and in a subsequent substantially contiguous downstream position an inclined screen portion wherein

said sieve bend portion includes plural first longitudinal separating bars fixedly attached with respect to one another, each of said first bars having (i) a supporting surface for engaging one surface of the layer formation flow of particles and liquid passing thereby to define a local direction of flow thereof along said vector flow path, the supporting surfaces of said first bars between said feed end and said inclined screen portion generally conforming to a relatively smooth cylindrically curved plane having a predetermined radius, each of said first bars also having (ii) a separating surface facing in a direction opposed to the local direction of flow and disposed in a transverse plane intersecting a plane of the associated supported surface along a line perpendicular to the local direction of flow, the separating surface of each first bar being spaced from the adjacent upstream first bar to define therewith a first separating aperture having a substantially constant width dimension as measured in the local direction of flow, and wherein

said feeding means feeds said particles and liquid in layer formation onto the feed end of said screen deck in a direction substantially tangential to said generally conforming plane of the supporting surface and perpendicular to said intersecting line of the separating surface of the first bars adjacent thereto, the flow of the slurry mixture across the supporting surface of each first bar along said vector flow path being such that the separating surface of a succeeding first bar which defines therewith an associated first separating aperture will block from the surface of the layer formation flow engaged by the supporting surface a thin layer of a thickness at most of the order of one-quarter of the width of the associated first separating aperture so that the liquid in successive blocked layer together with at least a portion of the particles entrained therein will pass through the associated first separating apertures and the remaining liquid and particles will pass on to the inclined screen portion of said screen deck; and wherein

said inclined screen portion includes plural second longitudinal separating bars fixedly attached with respect to one another and spaced apart relative to said vector flow thereby defining second separating apertures between successive said second bars, said second bars between said sieve bend portion and said discharge end defining a generally planar separation surface;

means for fixedly mounting said sieve bend and inclined screen portions with respect to each other and for mounting said combined screen deck to permit for vibratory movement thereof; and

vibratory means for imparting vibratory movement to said screen deck such that a major vector of said vibratory movement is generally upwards and backwards relative to said vector flow path to effect substantial separation of said liquid from said particles.

15. A vibratory screening apparatus for removing liquid from a feed of dilute slurry mixture so that a concentrated slurry mixture is discharged therefrom, said apparatus comprising:

feeding means for feeding a layer formation flow of a dilute slurry mixture of particles and liquid;

a screen deck defining a generally unitary surface having a feed end adapted for receiving said dilute slurry mixture and a discharge end of discharging a substantially concentrated slurry mixture thereover, said feed and discharge ends defining therebetween a vector flow path along which said slurry mixture will flow as it continuously moves from said feed end to said discharge end, said screen deck including downstream from said feed end an initial sieve bend portion and in a subsequent substantially contiguous downstream position an inclined screen portion wherein

said sieve bend portion includes plural first longitudinal separating bars fixedly attached to one another, each of said first bars having (i) a supporting surface for engaging one surface of the layer formation flow of particles and liquid passing thereby to define a local direction of flow thereof along said vector flow path, the supporting surfaces of said first bars between said feed end and said inclined screen portion generally conforming to a relatively smooth cylindrical curved plane having a predetermined radius, each of said first bars also having (ii) a separating surface facing in a direction opposed to the local direction of flow and disposed in a transverse plane intersecting a plane of the associated supporting surface

along a line perpendicular to the local direction of flow, the separating surface of each first bar being spaced from the adjacent upstream first bar to define therewith a first separating aperture having a substantially constant with dimension as measured in the local direction of flow, and wherein

said feeding means feeds said particles and liquid in layer formation onto the feed end of said screen deck in a direction substantially tangential to said generally conforming plane of the supporting surface and perpendicular to said intersecting line of the separating surface of the first bars adjacent thereto, the flow of the slurry mixture across the supporting surface of each first bar along said vector flow path being such that the separating surface of a succeeding first bar which defines therewith an associated first separating aperture will block from the surface of the layer formation flow engaged by the supporting surface a thin layer of a thickness at most of the order of one-quarter of the width of the associated first separating aperture so that the liquid in successive blocked layers together with at least a portion of the particles entrained therein will pass through the associated first separating apertures and the remaining liquid and particles will pass on to the inclined screen portion of said screen deck; and wherein

said inclined screen portion includes second longitudinal separating bars fixedly attached with respect to one another and spaced apart relative to said vector flow thereby defining second separating apertures between successive said second bars, said second bars between said sieve bend portion and said discharge end defining a generally planar separation surface;

means for fixedly mounting said sieve bond and inclined screen portions with respect to each other and for mounting said combined screen deck to permit for vibratory movement thereof; and

vibratory means operatively connected to said screen deck for imparting vibratory movement thereto such that a major vector of said vibratory movement is in a direction generally opposing said vector flow path to partially impede the flow of said slurry mixture across said inclined screen portion so as to establish a layer of concentrated slurry mixture thereon, which layer exhibits a predetermined maximum depth in the vicinity of said discharge end and gradually decreases in an upstream direction, whereby said vibratory means removes an additional amount of said liquid which remains in the slurry mixture as it initially flows onto said inclined screen portion after flowing across said sieve bend portion as said slurry mixture continues to flow along said vector flow path to said discharge end.

4,519,903

FILTER MACHINE

Willard L. Johnson, 12923 Lincoln Rd., Huntington Woods, Mich. 48070

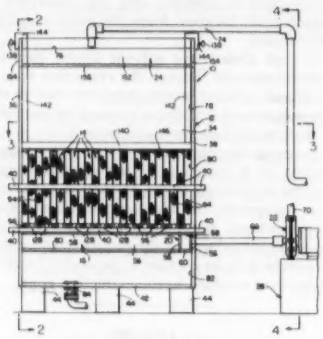
Filed Jan. 24, 1983, Ser. No. 460,288
Int. Cl.³ B01D *25/02*
U.S. Cl. 210—94 **20 Claims**

1. In a suction type filter machine having a tank to receive polluted liquids to be filtered or clarified and divided vertically into an upper open section, an intermediate filter leaves-containing section, and a lower solids-collection section, all sections being in free and open communication and connection with each other in a substantially vertical unitary chamber, the improvement in leaf-type filter units releasably connected to collecting manifolds, each unit comprising:

a core panel having transversely extending walls defining transverse liquid passageways therebetween, and openings through said walls defining means for communicating with and between said passageways;

a conduit permanently overlying and parallel to an edge and adjacent portions of said panel for collection, conduction and discharge of liquid filtrate from said core panel;

a filter medium enwrapping said core panel completely and said conduit substantially thereabout; and



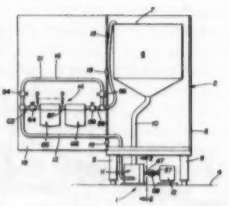
means for releasably connecting the conduit to a collecting manifold.

4,519,904

CONTINUOUS FILTERING SYSTEM FOR COOKING OIL

Timothy A. Helmick, 7465 Hills & Dales Rd., Massillon, Ohio 44646

Filed Feb. 10, 1984, Ser. No. 578,840
Int. Cl.³ B01D *35/00*
U.S. Cl. 210—167 **25 Claims**



1. Equipment in combination with a food fryer for continuously filtering and recirculating cooking oil contained in said fryer, said equipment including:

(a) a first conduit connected to an opening formed adjacent the bottom of the fryer;

(b) chopper pump means connected to the first conduit for chopping up food particles contained in the cooking oil flowing through the first conduit from the fryer and for pumping said cooking oil through said chopper pump means;

(c) a second conduit operatively connected to the chopper pump means for conveying the cooking oil and chopped food particles from the chopper pump means;

(d) filter means operatively connected to the second conduit for removing the chopped food particles from the cooking oil; and

(e) a third conduit connected to the filter means for conveying the filtered oil from the filter means back into the fryer.

18. A device in combination with a system for the continuous filtering and recirculating of cooking oil contained in a food dryer, said device including:

(a) a housing formed with a cylindrical-shaped chamber;

(b) inlet and outlet passages communicating with the chamber; and

(c) a rotor rotatably mounted in the chamber and adapted to

be operatively connected to a motor for rotatably driving said rotor, said rotor having a plurality of spaced outwardly extending vanes for chopping up food particles contained in the cooking oil and for moving the cooking oil and food particles from the inlet passage through a portion of the chamber and out of the outlet passage.

4,519,905

HIGH PERFORMANCE ANALYTICAL COLUMN FOR ANION DETERMINATION

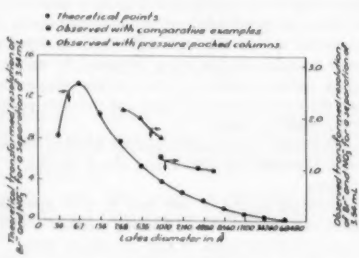
Timothy S. Stevens, and Martin A. Langhorst, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 431,431, Sep. 30, 1982, abandoned, which is a continuation of Ser. No. 234,520, Feb. 17, 1981, abandoned. This application Jul. 2, 1984, Ser. No. 626,569

The portion of the term of this patent subsequent to May 10, 2000, has been disclaimed.

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—198.2 **58 Claims**



1. A chromatographic analytical column, the column containing a pellicular type (agglomerated) anion-exchange packing, comprising:

Component A, which comprises a pressure packed bed of substrate particles of insoluble synthetic resin, having cation-exchanging sites at least on their available surfaces, the Component A particles being of low porosity relative to Component B microparticles, described below, and

Component B, derived by agglomerating microparticles of insoluble synthetic resin onto the pressure packed bed of Component A particles, the microparticles having a volume average diameter of less than about 1000 Angstroms and greater than about 50 Angstroms and having anion-exchanging sites, at least on their outer surfaces, which attract available cation sites of Component A, wherein the microparticles of Component B are attached as a monolayer to the available surfaces of the Component A particles.

4,519,906

APPARATUS FOR THE SEPARATION OF MAGNETIC AND NONMAGNETIC SOLID PARTICLES FROM A LIQUID

Shinichi Hikosaka, Tokyo; Kosho Murayama, Kawasaki; Shinichi Fukuura, Kawaguchi, and Takaomi Yanase, Ichikawa; all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 380,871, May 21, 1982, abandoned. This application Sep. 15, 1983, Ser. No. 533,062

Claims priority, application Japan, May 25, 1981, 56-75414

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—223 **6 Claims**

1. Apparatus for the separation of solid particles from a liquid, comprising:

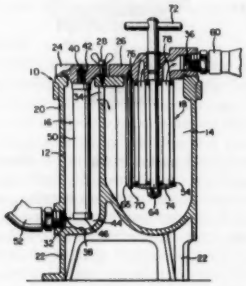
means defining a vertically extending first cylindrical liquid chamber having a top and a downwardly concave rounded bottom and means defining an inlet port for the liquid which is formed adjacent to the rounded bottom;

a magnet assembly disposed vertically and concentrically in the first liquid chamber for the removal of magnetic solid particles from the liquid, said magnet assembly including a cylindrical housing, suspended from the top of the first liquid chamber and extending downwardly defining a space between a lower extremity of said magnet assembly and the rounded bottom, and a plurality of magnets enclosed in a row in the housing;

a vertically extending second cylindrical liquid chamber disposed adjacent to the first liquid chamber and having a top and a downwardly concave bottom;

overflow port means provided between the top portions of the first and second liquid chambers for passing therethrough an overflow of the liquid from within the first liquid chamber into the second liquid chamber;

a vertically extending hollow cylindrical filter assembly for the removal of nonmagnetic particles, said filter assembly



being suspended from the top of the second liquid chamber and terminating short of the bottom of the second liquid chamber;

outlet port means communicating with the interior of said cylindrical filter assembly for the withdrawal of the liquid which has passed through the filter assembly;

means forming a discharge opening provided through a side wall of a lower end portion of the second liquid chamber and directed horizontally, said downwardly concave bottom of the second liquid chamber having a portion arcuately sloping downwardly and extending horizontally to the lower part of the discharge opening to expedite the discharge of accumulated solid in the second liquid chamber, the discharge opening being of a transverse size on the order of the diameter of the second liquid chamber;

a cover in the form of a plate screwed to the outer surface of said side wall of the second liquid chamber so as to close the discharge opening and having means defining a horizontal drain port in the lower part of said cover; and

a drain cock connected to said drain port.

4,519,907

GRIT SETTLING BASIN INCLUDING VANE PUMP

Thomas C. Rooney, Waukesha, Wis., assignor to Rexnord Inc., Brookfield, Wis.

Filed Dec. 19, 1983, Ser. No. 562,649

Int. Cl.³ B01D *21/18, 21/10;* **B03D** *1/14*

U.S. Cl. 210—257.1 **8 Claims**

1. Apparatus for separating grit from liquid sewage while retaining organic solids in suspension including inlet means for admitting liquid sewage into the apparatus, outlet means for removing liquid from which grit has been separated from the apparatus, and means for removing separated grit from the apparatus, the apparatus further comprising:

a cylindrical grit settling chamber,

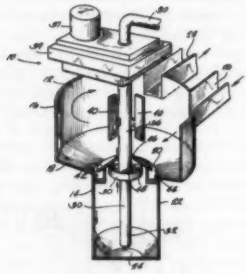
a cylindrical grit storage chamber positioned below the cylindrical grit settling chamber such that grit settling out of said liquid will settle into said grit storage chamber, said cylindrical grit storage chamber including a circular wall having an upper edge,

a vertical shaft positioned centrally in said cylindrical grit settling chamber and in said grit storage chamber, said shaft having a longitudinal axis,

means for causing rotation of said central shaft about said longitudinal axis,

a partition surrounding said shaft and separating said cylindrical grit settling chamber and said cylindrical grit storage chamber, said partition having a circular peripheral edge adjacent and spaced inwardly from said circular wall of said cylindrical grit storage chamber, said peripheral edge and said circular wall being spaced so as to define a first annular opening therebetween, and said partition including a circular central aperture housing said shaft, said circular aperture being spaced from said shaft to define a second annular opening between said shaft and said partition to provide for upward flow of liquid, and

mechanical means positioned within the storage chamber for causing vertical upward flow of liquid through said second annular opening and vertical downward flow of said liquid through said first annular opening.



4,519,908

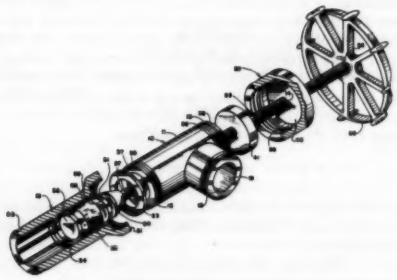
VALVE FOR CONTROL OF FLUID FLOW

Seth D. Woodruff, 4411 Via Amable, San Diego, Calif. 92122

Filed Mar. 12, 1984, Ser. No. 588,197

Int. Cl.³ B01D *35/02*

U.S. Cl. 210—287 **4 Claims**



1. A valve for controlling fluid flow at low flow rates comprising:

(a) an upper housing comprising a main conduit of circular cylindrical configuration elongated about a center axis, and having an open lower threaded extremity and an upper extremity provided with closure means, and a side conduit of circular cylindrical configuration communicating with said main conduit and terminating in a threaded distal extremity,

(b) a lower housing having a circular cylindrical bore terminating in open upper and lower threaded extremities, the upper extremity of said lower housing being adpated to releasably join in a fluid impervious manner with the lower extremity of said main conduit with alignment of said upper and lower housings upon said center axis, and retaining means inwardly protruding into said cylindrical bore,

(c) a threaded shaft which extends through said closure means in threaded engagement therewith and in coaxial alignment with said center axis, having a first extremity disposed above said upper housing, and an opposed second extremity,

(d) a manipulating handle affixed to the first extremity of said threaded shaft,

(e) a foot is swiveled engagement with the second extremity of said threaded shaft and having a flat lower face of circular periphery perpendicularly disposed to said center axis,

(f) upper and lower rigid porous boundary means of circular periphery perpendicularly disposed to said center axis and positioned within the bore of said lower housing, said lower boundary means being supported by said retaining means, and said upper boundary means lying in abutment with the lower face of said foot and slideably positionable within said bore, and

(g) a resiliently compressable porous filtering medium disposed between said upper and lower boundary means, whereby

(h) downward urging of said foot by said threaded shaft causes compression of said filtering medium which results in controlled occlusion of said cylindrical bore.

4,519,909

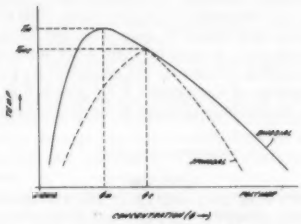
MICROPOROUS PRODUCTS

Anthony J. Castro, Oak Park, Ill., assignor to Akzona Incorporated, Enka, N.C.

Continuation of Ser. No. 814,351, Jul. 11, 1977, abandoned, which is a continuation-in-part of Ser. No. 718,549, Aug. 30, 1976, abandoned. This application Nov. 23, 1979, Ser. No. 97,474

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—500.2 **63 Claims**

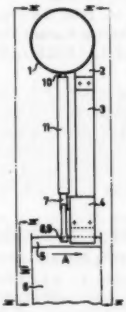


1. A relatively homogeneous, three-dimensional, microporous cellular polymer structure comprising a plurality of substantially spherical cells having an average diameter from about 0.5 to about 100 microns, distributed substantially uniformly throughout the structure, adjacent cells being interconnected by pores smaller in diameter than said microcells, the ratio of the average cell diameter to the average pore diameter being from about 2:1 to about 200:1, said pores and said cells being void and said polymer being a synthetic thermoplastic polymer selected from the group consisting of olefinic polymers, condensation polymers, oxidation polymers and blends thereof.

4,519,910
APPARATUS FOR REMOVING A FIBER LAYER FROM A ROTATING DISC FILTER

Samuel Ragnegard, Hedemora; Kent Strid, Gränges berg, and Göran Sundkvist, Hedemora, all of Sweden, assignors to AB Hedemora Verkstalder, Hedemora, Sweden

Filed Jul. 8, 1983, Ser. No. 512,075
Int. Cl.³ B01D *25/34, 33/26*
U.S. Cl. 210—327 8 Claims



1. Apparatus for removing a fiber layer from a rotating disc filter consisting of a number of filter discs mounted side by side on a common shaft, each filter disc having a periphery, said apparatus comprising

gas and/or liquid spray means for removing the fiber layer and positioned close to each such periphery of the filter disc,

a slide shoe fixed in relation to said spray means, and

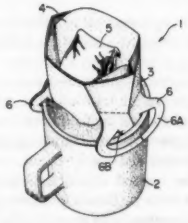
guide means positioned about the periphery of the filter disc for guiding said slide shoe,

said slide shoe being arranged with play relative to said guide means and being suspended by a pendulum means that permits an oscillation to take place in the axial direction of the filter discs in response to axial movement of the filter discs.

4,519,911
PAPER EXTRACTOR

Kimiaki Shimizu, Tokyo, Japan, assignor to System Communications, Inc., Tokyo, Japan

Filed Mar. 29, 1983, Ser. No. 480,506
Claims priority, application Japan, Jun. 3, 1982, 57-82820[U]
Int. Cl.³ B01D *23/28*
U.S. Cl. 210—478 3 Claims



1. A paper extractor, comprising:

a thin walled, collar-shaped support member, having therein:

means defining an upper opening;

means defining a lower opening;

a plurality of substantially longitudinally first folds extending between said upper and lower openings, allowing said support member to be folded into a flat shape;

two V-shaped second folds, opening upwardly with respect to said lower opening, each second fold intersecting one of said longitudinal folds; and

support legs extending from said second folds, bendable at said second folds to extend outwardly from the support member;

a filter attached to an inner surface of said support member; and

a coffee pack comprising coffee powder sealed in a bag of filter material, for insertion into said support member in juxtaposed relationship to the filter attached thereto.

4,519,912
PROCESS FOR THE REMOVAL OF SULFATE AND METALS FROM AQUEOUS SOLUTIONS

Jim W. Kauffman; William C. Laughlin, both of Edmond, and Roger A. Baldwin, Oklahoma City, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 1, 1984, Ser. No. 616,416
Int. Cl.³ C02F *3/34*
U.S. Cl. 210—611 19 Claims

1. A process for reducing the concentration of water soluble ionic selenium species, sulfate ions and ionic heavy metal species in an aqueous solution containing the same comprising:

providing an aqueous solution containing said water soluble ionic selenium species, sulfate ions and ionic heavy metal species, said aqueous solution having a pH of at least about 6.0;

providing a porous matrix containing a population of bacteria comprising at least one anaerobic bacteria of the genus Clostridium and at least one anaerobic bacteria selected from the group consisting of bacteria of the genera Desulfovibrio and Desulfotomaculum, said bacteria being capable of matabolically reducing said ionic selenium species to water insoluble metallic selenium and said sulfate ions to hydrogen sulfide, respectively, said matrix being under anaerobic conditions; and

passing said aqueous solution through said porous matrix in the presence of nutrients and at predetermined temperatures, said nutrients and said temperatures providing for the growth and steady state population density of said bacteria, to contact the ionic selenium species and the sulfate ions in said aqueous solution with the bacteria contained in the porous matrix whereby said bacteria metabolically reduce at least a portion of the ionic selenium species to water insoluble metallic selenium and at least a portion of the sulfate ions to hydrogen sulfide which, in turn, reacts with at least a portion of the water soluble ionic heavy metal species to form water insoluble heavy metal species, said water insoluble metallic selenium and water insoluble heavy metal species being substantially retained on the porous matrix, and to produce an aqueous effluent having a reduced concentration of said water soluble ionic selenium species, sulfate ion and ionic heavy metal species.

4,519,913
PROCESS FOR THE REMOVAL AND RECOVERY OF SELENIUM FROM AQUEOUS SOLUTIONS

Roger A. Baldwin, Oklahoma City; John C. Stauter, Edmond; Jim W. Kauffman, Edmond, and William C. Laughlin, Edmond, all of Okla., assignors to Kerr-McGee Corporation, Oklahoma City, Okla.

Filed Jun. 1, 1984, Ser. No. 616,417
Int. Cl.³ C02F *3/34*
U.S. Cl. 210—611 19 Claims

1. A process for reducing the concentration of water soluble selenium ions in an aqueous solution containing the same comprising:

providing an aqeuous solution containing water soluble

selenium ions, said aqueous solution having a pH of at least about 6.0;

providing a porous matrix containing a population of bacteria comprising anaerobic bacteria of the genus Clostridium, said bacteria being capable of metabolizing said selenium ions to water insoluble selenium metal, said matrix being under anaerobic conditions; and

passing said aqueous solution through said porous matrix in the presence of nutrients and at predetermined temperatures, said nutrients and said temperatures providing for the growth and steady state population density of said bacteria, to contact the selenium ions in said aqueous solution with the bacteria contained in the porous matrix whereby said bacteria metabolically reduce at least a portion of the water soluble selenium ions to water insoluble selenium metal, which metal is substantially retained on the porous matrix, and to produce an aqueous effluent having a reduced concentration of said water soluble selenium ions.

4,519,914

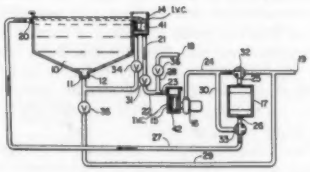
METHOD FOR TREATING SWIMMING POOL WATER

Kenji Etani, P.O. Box 206, West Townsend, Mass. 01474

Division of Ser. No. 040,302, May 18, 1979, abandoned, which is a continuation-in-part of Ser. No. 934,425, Aug. 17, 1978, abandoned, which is a continuation of Ser. No. 717,514, Aug. 25, 1976, abandoned, which is a continuation-in-part of Ser. No. 591,536, Jun. 30, 1975, abandoned. This application Mar. 31, 1980, Ser. No. 136,156

Int. Cl.³ E04H *3/20*

U.S. Cl. 210—633 **3 Claims**



1. The method of feeding water treatment chemicals into a swimming pool including

(a) a tank,

(b) a pump,

(c) an intermediate-velocity chamber,

(d) piping to interconnect said pump, tank, and chamber in a recirculating system, and

(e) a quantity of water within said tank, pump, chamber, and piping, which method comprises the steps of:

(1st) placing a feeder within said intermediate-velocity chamber of said system, and

(2nd) subjecting said feeder to flow of said water at intermediate velocity thereby to extract a dose of chemical contained in said feeder at a controlled rate, wherein

(i) said feeder is a compact container of volume between 0.1 and less than 24 cubic inches, resistant to attack by water and said chemical, perforated by a number of small holes each less than three square millimeters in cross section and greater than five thousandths of an inch (0.005") in diameter, and with an aggregate area of said holes less that 0.02% of the surface area of said feeder, and is close enough to spherical in shape and close enough to neutral in buoyancy dependant on said water velocity, that said flow causes said feeder randomly to move about freely and roll,

(ii) said chamber is of sufficient size to contain said feeder without substantial restriction of flow and to let said feeder move to stir its contents, and

(iii) said dose comprises a chemical from the group consisting of flocculants, coagulants, microbiocides, chelating agents, defoamers, germicides, evaporation retarders, and dyes.

4,519,915

CLARIFICATION OF BLACK WATER PRODUCED DURING RECOVERY OF BITUMENS AND HEAVY OILS

Albert E. George, Kanata, and Marc-Andre Poirier, Ottawa, both of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Energy, Mines and Resources, Ottawa, Canada

Filed Jun. 14, 1984, Ser. No. 620,676

Claims priority, application Canada, Aug. 5, 1983, 433992

Int. Cl.³ C02F *1/28*

U.S. Cl. 210—663 **4 Claims**

1. In a process for the recovery or extraction of bituminous or heavy oil wherein emulsions of oil and water are formed and these emulsions are broken leaving a black water, the improvement which comprises clarifying the black water by contacting it with a particulate clarifying agent selected from high ash coal, high ash coal rejects, lignite ash, fly ash from coking gas and red mud.

4,519,916

PROCESS FOR INTERNAL REGENERATION OF ION EXCHANGER RESINS IN MIXED BED FILTERS, AND MIXED BED FILTERS FOR CARRYING OUT THE PROCESS

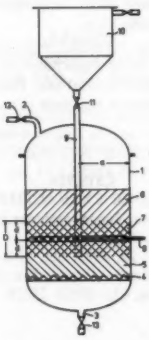
Friedrich Martinola, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,164

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1983, 3313471

Int. Cl.³ B01J *49/00*

U.S. Cl. 210—678 **8 Claims**



1. In the internal regeneration of mixed bed filters wherein the exhausted ion exchanger mass of the mixed bed is separated into cation exchanger and anion exchanger by means of upward flowing liquid, the cation exchanger and anion exchanger are separately regenerated and washed out and then both components are mixed again to form the mixed bed for the next loading stage the improvement comprising the following steps:

(a) loading the mixed bed filter,

(b) adding to the loaded mixed exchangers the interface layer removed in step (f) hereinbelow,

(c) passing liquid upwardly to separate the mixed exchangers into anion exchanger and cation exchanger,

(d) separately regenerating the anion exchanger and the cation exchanger in the same vessel employed for filtration,

(e) washing the regenerated anion and cation exchangers,

(f) removing from the filter in the region of the cation exchanger/anion exchanger interface a layer of material

without substantial disruption of the bodies of ion exchanger adjacent said layer, and

(g) mixing the anion and cation exchangers remaining in the vessel to provide the mixed bed for the next loading stage.

4,519,917

COUNTER-CURRENT ADSORPTION FILTERS FOR THE TREATMENT OF LIQUIDS AND A METHOD OF OPERATING THE FILTER

Friedrich Martinola, Köln-Flittard, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

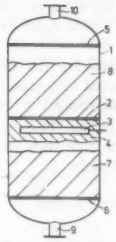
Continuation of Ser. No. 309,614, Oct. 1, 1981, Pat. No. 4,400,278. This application Apr. 6, 1983, Ser. No. 482,663

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040616

The portion of the term of this patent subsequent to Aug. 23, 2000, has been disclaimed.

Int. Cl.³ C02F *1/42*

U.S. Cl. 210—678 **3 Claims**



1. A method of operating a counter-current adsorption filter column or an ion exchange column wherein

(a) different adsorbents or ion exchangers are in each of two different chambers in the column defined by a horizontal subdivision;

(b) the adsorbents or ion exchangers of the two chambers are respectively regenerated with different regenerating agents;

(c) the lower chamber is equipped with a liquid drainage system which is located below the device which is permeable to liquid and forms the upper boundary of the chamber, and which is embedded in a layer of inert material; and

(d) the amount of adsorbent or ion exchanger (in % by volume) in the individual chambers is 50 to 98% of the free volume of the chamber, the method comprising

(i) in the loading phase passing stream of liquid to be treated from the bottom upwards through the chambers, and

(ii) in the regenerating phase, chamber by chamber introducing a regenerating agent and wash water into the top of each chamber to be regenerated, and removing the spent regenerating agent and washing water through the liquid drainage system of the chamber below simultaneously with a stream of water which flows in counter-current to the stream of the spent regenerating agent and washing water and which is being passed from the bottom upwards through the lower chamber.

4,519,918

PROCESS FOR THE ABSORPTION OF ORGANIC LIQUIDS BY USE OF A HYDROPHOBIC FIBROUS MATERIAL

Thomas Ericsson, Mölndal; Sten Gylfe, Krylbo, and Mats-Olov Hedblom, Avesta, all of Sweden, assignors to Papyrus Kopparfors AB, Mölndal, Sweden

Filed Jan. 24, 1983, Ser. No. 460,412

Claims priority, application Sweden, Jul. 27, 1981, 8104567; Fed. Rep. of Germany, Jul. 24, 1982, 3227949

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—680 **4 Claims**

1. A process for the absorption of surface layers of water-insoluble organic liquids floating on water which comprises contacting the surface layer with hydrophobic fibrous material prepared by impregnating cellulose pulp fibers with a liquid resinous material selected from the group consisting of acrylate prepolymers, alkyd prepolymers, and polyester prepolymers in an amount to provide in the impregnated fibrous material from about 0.5 to about 30% by weight polyacrylate, polyalkyd or polyester, and then hating the impregnated cellulose pulp fibers to convert the prepolymer by chemical reaction into a hydrophobic polymer rendering the cellulose pulp fibers hydrophobic.

4,519,919

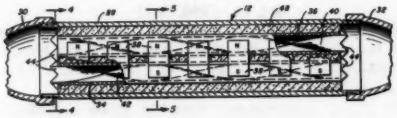
METHOD AND APPARATUS FOR MAGNETICALLY TREATING FLUIDS

Lance Whyte, 5307 Queensberry Ave., Springfield, Va. 22151, and Elliott E. Herweyer, P.O. Box 257, Goochland, Va. 23063

Filed May 19, 1983, Ser. No. 496,243

Int. Cl.³ B01D *35/06*

U.S. Cl. 210—695 **19 Claims**



1. The method of subjecting a flowing fluid to an interrupted monopolar magnetic force field comprising the steps of:

(1) dividing the fluid into at least two separate independent non-paramagnetic flow paths;

(2) subjecting the fluid within each of the separate flow paths to an interrupted monopolar magnetic influence of opposite polarity; and

(3) recombining at least a portion of said fluids in said divided flow paths into a common flow path.

4,519,920

MALEIC ACID/(METH)ACRYLIC ACID COPOLYMERS USEFUL AS CALCIUM ION CAPTURING AGENTS

Yasuhisa Fukumoto, and Noboru Moriyama, both of Utsunomiya, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Division of Ser. No. 360,518, Mar. 22, 1982, abandoned. This application Apr. 9, 1984, Ser. No. 597,814

Claims priority, application Japan, Apr. 13, 1981, 56-55351

Int. Cl.³ C08F *220/04*

U.S. Cl. 210—701 **6 Claims**

1. A process for treating water to inhibit formation of scale on surfaces contacted by the water, which comprises: mixing in the water an effective amount of a calcium ion capturing agent for chelating the calcium ions contained in the water to prevent deposition of scale on surfaces contacted by the water, said calcium ion capturing agent being an alkali metal salt of a copolymer of maleic acid (MA) and a monomer (AA) selected from the group consisting of acrylic acid and methacrylic acid, wherein the mol ratio (γ) of the monomer units MA/AA is

from 1.15 to 2.7, the number average molecular weight (MW) of the copolymer is from 1000 to 8000, and the product of (γ) multiplied by (MW) is at least 3000.

4,519,921

METHODS FOR REMOVING POLLUTANTS FROM WATER AND WASTE WATER AND FOR REDUCING SLUDGE RESISTANCE TO DEWATERING

James J. Russ, Lawrenceburg; John W. Smith, Germantown, both of Tenn., and Janet S. Condra, Vicksburg, Miss., assignors to Hydro Fuels, Inc., Wilmington, Del.

Filed Aug. 11, 1983, Ser. No. 523,033
Int. Cl.³ C02F *1/52*
U.S. Cl. 210—716 **18 Claims**

1. A method for removing pollutants from water comprises reacting fly ash comprising silica, aluminum and iron with an aqueous base at a temperature of at least about 90° C., recovering a base-treated solid fly ash with aqueous mineral acid, and recovering an aqueous, acidic, solubilized fly ash leachate; and mixing water containing at least one pollutant selected from the group consisting of solubilized inorganic substances and suspended inorganic substances with an amount of said aqueous, acidic, solubilized fly ash leachate sufficient to reduce significantly the concentration of said pollutant in said water.

4,519,922

ENVIRONMENTALLY COMPATIBLE HIGH DENSITY DRILL MUD OR BLOW-OUT CONTROL FLUID

David L. Sutton, and Michael L. Walker, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Mar. 21, 1983, Ser. No. 477,049
Int. Cl.³ C09K *7/00*
U.S. Cl. 252—8.5 B **10 Claims**

1. A fluid suitable for use as a drilling fluid and a blow-out fluid comprising:

(a) water

(b) a gelling agent selected from the group consisting of oxides of antimony, zinc oxide, barium oxide, barium sulfate, barium carbonate, iron axide, hematite, other iron ores and mixtures thereof wherein said gelling agent has a physical make-up with regard to fine particle size, high density and intersurface attration properties sufficient to create a slurry with said water that has a gel strength of at least 10 pounds per 100 square feet and said gelling agent has an average particle diameter size in the range of from about 0.5 to about 10.0 micrometers; and,

(c) a weighting material selected from the group consisting of iron powder, hematite, other iron ores, steel shot, tungesten, tin, manganese, iron shot, and mixtures thereof wherein said weighting material has an average particle diameter size of from about 2 to about 20 times the average particle size of the gelling agent;

said fluid having a density of from 24 pounds per gallon to about 40 pounds per gallon.

4,519,923

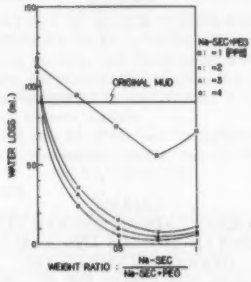
FLUID COMPOSITION FOR DRILLING

Yuji Hori, Otsu; Yoshichika Nishimura, and Fuminobu Takahashi, both of Kyoto, all of Japan, assignors to Dai-Ichi Kogyo Seiyaku Co., Ltd., Kyoto, Japan

Filed Apr. 3, 1984, Ser. No. 596,223
Claims priority, application Japan, Apr. 6, 1983, 58-60392; Apr. 19, 1983, 58-69810; Oct. 14, 1983, 58-193210
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 C **10 Claims**

1. A fluid composition for drilling comprising:

(a) a drilling fluid containing at least one of monovalent and polyvalent salts, and



(b) an alkali metal salt of sulfoethylcellulose which has a degree of substitution of 0.5 to 2.5 and of which a 1 % by weight aqueous solution has a viscosity of 5 to 5,000 cP.

4,519,924

LITHIUM STEARATE ALUMINATE AS LUBRICANT ADDITIVE

Kishore K. Kar, Midland, Mich., assignor to The Dow Chemical, Midland, Mich.

Filed Jun. 11, 1984, Ser. No. 619,442
Int. Cl.³ C10M *1/54, 5/14, 5/16*
U.S. Cl. 252—35 **13 Claims**

1. A method for improving the anti-friction properties of lubrication fluids subjected to intensive shearing or grinding forces, said method comprising

uniformly dispersing in said fluid, as small particles, crystalline lithium stearate aluminate comforming substantially to the empirical formula

$$Li(C_{17}H_{35}CO_2).2Al(OH)_3.nH_2O$$

where n represents zero or more for waters of hydration.

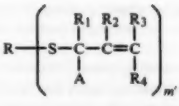
4,519,925

SULFUR-CONTAINING COMPOUNDS AND LUBRICANTS CONTAINING THEM

Donald M. Smith, Euclid, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 943,430, Sep. 18, 1978, abandoned, which is a continuation-in-part of Ser. No. 681,107, Apr. 28, 1976, Pat. No. 4,129,510. This application Sep. 22, 1980, Ser. No. 189,465
The portion of the term of this patent subsequent to Dec. 12, 1995, has been disclaimed.
Int. Cl.³ C10M *1/38*
U.S. Cl. 252—48.6 **10 Claims**

1. A sulfur containing compound of formula



wherein R is a hydrocarbyl radical containing up to about 50 carbon atoms; each of R_1, R_2, R_3 and R_4 is independently hydrogen or a hydrocarbyl radical; m' is from 1 to about 5; and each A is a substituted alkyl radical wherein the substituent is at least one carboxyl group or functional derivative thereof.

10. A lubricant composition comprising, respectively, a

major amount of an oil of lubricating viscosity and up to about 15% of at least one compound of claim 1.

4,519,926

POLYBORATE ESTERS AND THEIR USE IN LUBRICANTS

Robert J. Basalay; C. Thomas West, and Dennis G. Petrille, all of Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 18, 1983, Ser. No. 467,951
Int. Cl.[3] C10M *1/50, 1/10, 3/02, 7/48*
U.S. Cl. 252—49.6 20 Claims

16. A lubricant composition comprising a major portion of a lubricating oil in combination with a polyborate ester composition wherein the amount of said polyborate ester composition is from about 0.01 to about 15 weight percent of said lubricant composition and wherein said polyborate ester composition is prepared by the process which comprises:

(a) reacting ortho-boric acid with at least one hydroxyl-containing compound selected from the group consisting of monohydroxy alcohols of at least 3 carbon atoms and monohydroxy phenols in a substantially inert organic liquid at a temperature in the range from about 80° to about 300° C., wherein said organic liquid is immiscible with water and has a boiling point in the range from about 80° to about 300° C. at standard pressure, the ratio of equivalents of hydroxyl-containing compound to moles of ortho-boric acid is in the range from about 0.5 to about 1.5, and the water which is produced by said reaction is continuously removed; and

(b) removing substantially all of said organic liquid from the product of (a).

4,519,927

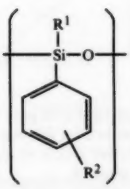
LUBRICANT FOR USE AT HIGH TEMPERATURE

Hiromichi Seiki, Ichihara, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Dec. 29, 1983, Ser. No. 566,497
Claims priority, application Japan, Jan. 17, 1983, 58-4225
Int. Cl.[3] C10M *1/50, 3/44*
U.S. Cl. 252—49.6 17 Claims

1. A lubricating oil for lubricating bearing useful at high temperatures of 200° C. or higher, comprising:

(A) from 25 to 98% by weight of an arylalkyl silicone having a repeating unit represented by the general formula (I):



wherein R^1 is an alkyl group containing from 1 to 6 carbon atoms, and R^2 is an alkyl group containing from 1 to 3 carbon atoms or a hydrogen atom, and having a kinematic viscosity as determined at 100° C. of from 5 to 300 centistokes; and

(B) from 75 to 2% by weight of a fatty acid ester of a hindered alcohol.

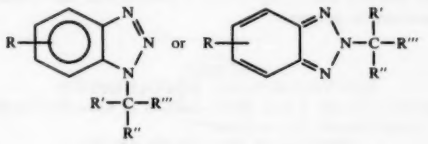
4,519,928

LUBRICANT COMPOSITIONS CONTAINING N-TERTIARY ALKYL BENZOTRIAZOLES

Milton Braid, Westmont, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 115,521, Jan. 25, 1980, abandoned, which is a continuation of Ser. No. 938,608, Aug. 31, 1978, abandoned. This application Aug. 24, 1981, Ser. No. 295,918
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—50 6 Claims

1. A lubricant composition which comprises a major amount of an oil of lubricating viscosity and a minor amount, of at least about 1 weight percent based on the total weight of the composition, effective to impart antioxidative and metal corrosion prevention properties thereto, of N-t-alkylated benzotriazoles, having the formula:



where R is hydrogen or a hydrocarbyl group containing from 1 to about 12 carbon atoms, R′ and R″ are alkyl groups containing from 1 to about 4 carbon atoms, and R‴ is an alkyl group containing from 1 to about 12 carbon atoms.

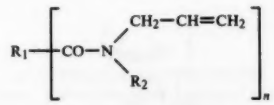
4,519,929

LUBRICATING OIL COMPOSITION CONTAINING N-ALLYL AMIDE GRAFT COPOLYMERS

Joseph P. O'Brien, Kirkwood, and Andrew G. Papay, Manchester, both of Mo., assignors to Edwin Cooper, Inc., St. Louis, Mo.

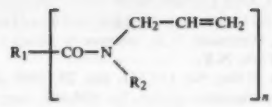
Filed Feb. 19, 1982, Ser. No. 350,205
Int. Cl.[3] C10M *1/32*
U.S. Cl. 252—51.5 A 31 Claims

1. An ashless dispersant suitable for use in lubricating oils and liquid fuels, said dispersant being an oil-soluble product made by a process comprising reacting an olefinic hydrocarbon polymer having an average molecular weight of about 500–500,000 with an N-allyl amide having the structure



wherein R_1 is selected from hydrogen and saturated hydrocarbon groups containing 1 to about 30 carbon atoms or R_1 may be absent and R_2 is selected from the group consisting of hydrogen, alkyls containing 1–30 carbon atoms, cycloalkyls containing 6–10 carbon atoms, aryls containing 6–10 carbon atoms, and allyl and n is 1 or 2 such that when R_1 is hydrogen n is 1, and when R_1 is absent n is 2, said reaction being conducted in the presence of a free radical generating catalyst at a temperature high enough to generate free radicals up to a temperature of about 250° C.

27. A process for making an oil soluble dispersant for use in lubricating oil, said process comprising reacting an N-allyl amide having the structure



wherein R_1 is selected from hydrogen and saturated hydrocarbon groups containing 1 to about 30 carbon atoms or R_1 may be absent, and R_2 is selected from the group consisting of hydrogen alkyls containing 1–30 carbon atoms, cycloalkyls containing 6–10 carbon atoms, aryls containing 6–10 carbon atoms, and allyl and n is 1 or 2 such that when R_1 is hydrogen n is 1, and when R_1 is absent n is 2, with an olefinic hydrocarbon polymer having the average molecular weight of about 500–500,000 in the presence of a free radical-generating catalyst whereby said N-allyl amide is grafted onto said olefinic hydrocarbon polymer.

4,519,930

ELECTROCHROMIC DISPLAY DEVICE

Hiroshi Kakiuchi, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,787

Claims priority, application Japan, Jan. 11, 1982, 57-2622; Sep. 7, 1982, 57-156065

Int. Cl.³ G02F *1/17*; C09K *3/00*

U.S. Cl. 252—62.2 **25 Claims**

1. An electrochromic display device comprising: at least two electrodes at least one of which is comprised of electrochromic material, and an electrolyte gel in contact with said electrodes and comprising an electrolytic solution absorbed and thereby gelated by a copolymer formed of a first monomer which when polymerized forms polymer soluble in the solvent of said electrolytic solution and a second monomer which when polymerized forms polymer insoluble in the solvent of said electrolytic solution in a proportion such that said copolymer is capable of absorbing an amount of said electrolytic solution sufficient to form a gel which is effective as an electrolyte.

4,519,931

MAGNETIC FLUID

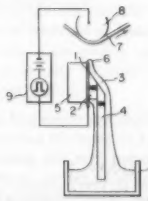
Mamoru Soga, Osaka; Keiichi Yubakami, Neyagawa; Nobuo Sonoda, Settsu, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jul. 26, 1982, Ser. No. 402,074

Claims priority, application Japan, Jul. 29, 1981, 56-119890

Int. Cl.³ H04B *35/00*; C09D *5/23*; H01F *1/00*

U.S. Cl. 252—62.51 **14 Claims**



1. A magnetic fluid suitable for use in image recording under the action of magnetic or electric force, comprising fine ferromagnetic particles dispersed in a liquid dispersing medium with the aid of a surfactant, and a suitable colorant dispersed or dissolved in said liquid dispersing medium, having the same charge as the liquid dispersing medium, said fluid being substantially free from colorant aggregation or separation in an electric field of 1 KV/mm.

4,519,932

LOW TEMPERATURE HYDRAULIC FLUIDS BASED ON TWO CENTISTOKE SYNTHETIC HYDROCARBONS

Nicholas E. Schnur, Cincinnati, Ohio, and Bruce J. Beimesch, Crescent Springs, Ky., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 419,897, Sep. 20, 1982, abandoned. This application Sep. 16, 1983, Ser. No. 532,879

Int. Cl.³ C10M *3/12, 3/20*; C07C *2/74*

U.S. Cl. 252—73 **9 Claims**

1. An improved low temperature, fire resistant hydraulic fluid having a 210° F. viscosity ≧3.45 centistokes, −65° F. viscosity <3000 and flashpoint ≧320° F. comprising

(a) 30 to 90 percent by weight of a synthetic hydrocarbon obtained by the oligomerization of a C_{6-12} alpha-olefin or alpha-olefin mixture and having a 210° F. viscosity of 1.6 to 2.2 centistokes;

(b) 5 to 50 percent by weight of a monoester or diester containing from 13 to 30 carbon atoms and having a 210° F. viscosity of ≧3.5 centistokes and −65° F. viscosity of <8000 centistokes, said monoester derived from a C_{6-17} aliphatic monocarboxylic acid and aliphatic branched-chain alcohol having from 8 to 12 carbon atoms and said diester derived from a C_{6-9} aliphatic dicarboxylic acid and aliphatic branched-chain alcohol having from 6 to 10 carbon atoms; and

(c) 5 to 20 percent by weight of a polymethacrylate viscosity index improver having a weight average molecular weight in the range 40,000 to 65,000 and intrinsic viscosity of 0.040 to 0.065.

4,519,933

METHOD OF PRODUCING DETERGENTS WITH LOWER LEVELS OF INCRUSTATION OF SALTS ON FABRICS BY INCORPORATING THEREIN ONLY TYPE A ZEOLITE DETERGENT BUILDERS HAVING A CERTAIN DETERMINED RATE CONSTANT

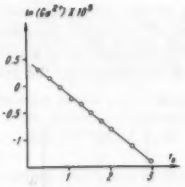
Robert Gresser, and Max Michel, both of Lyons, France, assignors to Rhone-Poulenc Chimie de Base, Courbevoie, France

Filed Jun. 7, 1983, Ser. No. 501,915

Claims priority, application France, Jun. 18, 1982, 82 10638

Int. Cl.³ C11D *3/06, 3/12, 11/00*

U.S. Cl. 252—140 **9 Claims**



1. A method of producing a detergent including a surfactant and a zeolite detergent builder having improved detergent effect represented by lower levels of incrustation of salts on fabrics comprising the steps of:

providing a type A zeolite having a mean particle diameter ranging from 0.1–10 microns and a cation exchange capacity in excess of about 100 mg $CaCO_3$ per gram of anhydrous material;

determining a rate constant k_s relative to the surface area of zeolite per liter of solution;

incorporating only those zeolites having k_s values in excess of about 0.15 $s^{-1}lm^{-2}$ in said detergents.

4. The method of producing detergents as defined by claim 1, said rate constant ranging from about 0.4 to 4 $s^{-1}lm^{-2}$.

4,519,934

LIQUID ENZYME CONCENTRATES CONTAINING ALPHA-AMYLASE

Jens H. Eilertsen, Virum; Arne D. Fog, Ballerup, and Keith Gibson, Hvidovre, all of Denmark, assignors to Novo Industri A/S, Denmark

Filed Apr. 19, 1983, Ser. No. 486,306

Int. Cl.³ C11D *7/42, 3/386, 7/50;* **C12N** *9/96*

U.S. Cl. 252—174.12 **8 Claims**

1. A liquid enzyme concentrate containing alpha-amylase from *Bacillus licheniformis,* which consists essentially of

the alpha-amylase from *Bacillus licheniformis* in a concentrate corresponding to an activity of from between 250° and 1000 KNU/g of concentrate;

1,2 propylene glycol in an amount of about 40 to about 95% by weight of the concentrate; and

water in an amount of about 50 to about 5% by weight of the concentrate;

whereby the pH of the concentrate is 5–9.

4,519,935

LIQUID-CRYSTALLINE MATERIAL CONTAINING AZO DYESTUFFS

Uwe Claussen, Leverkusen, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

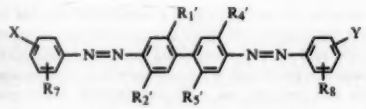
Continuation of Ser. No. 382,547, May 26, 1982, abandoned. This application Aug. 23, 1984, Ser. No. 643,752

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123519

Int. Cl.³ C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299.1 **10 Claims**

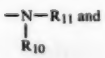
1. A liquid-crystal composition useful for displays comprising a liquid-crystal material having a positive dielectric antisotropy and 0.01 to 10% by weight of an azo dyestuff of the formula



(II)

in which

R_1', R_2', R_4' and R_5' designate hydrogen, halogen, C_1–C_6-alkyl C_1–C_6-alkoxy, with the proviso that at least one of these radicals is different from hydrogen, R_7 and R_8 designate hydrogen, halogen, C_1–C_6-alkyl, or C_1–C_6-alkoxy and X represents —OR_9, —SR_9 or



Y represents —OR_{12}, —SR_{12} or

wherein R_9 and R_{12} designate hydrogen, C_1–C_6-alkyl, cyclopentyl, cyclohexyl, phenyl, naphthyl, benzyl, phenethyl, acyl, aminocarbonyl, or benzyl which is substituted by halogen, nitro, C_1–C_4-alkyl, or C_1–C_4-alkoxy and wherein R_{10}, R_{11}, R_{13} and R_{14} represent hydrogen, C_1–C_4-alkyl, C_1–C_4-alkyl which is substituted by hydroxyl, cyano, phenoxy, C_1–C_4-alkoxy or by (C_1–C_4-alkoxy)-carbonyloxy, or R_{10}, R_{11}, R_{13} and R_{14} represent cyclohexyl, phenyl, naphthyl, benzyl, phenethyl, (C_1–C_4-alkyl)-carbonyl, benzoyl, (C_1–C_4-alkyl)-aminocarbonyl or phenylaminocarbonyl, and wherein X and Y are in the para position relation to —N=N—.

4,519,936

NEMATIC LIQUID CRYSTALS AND METHOD OF PRODUCTION

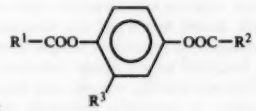
Dietrich Demus, Halle; Wolfgang Weissflog, Halle-Neustadt, and Horst Kresse, Halle, all of German Democratic Rep., assignors to VEB Werk fuer Fernsehelektronik im Kombinat Mikroelektronik, Berlin, German Democratic Rep.

Filed Jul. 20, 1982, Ser. No. 400,170

Int. Cl.³ G02F *1/13;* **C09K** *3/34;* **C07C** *231/119, 231/120*

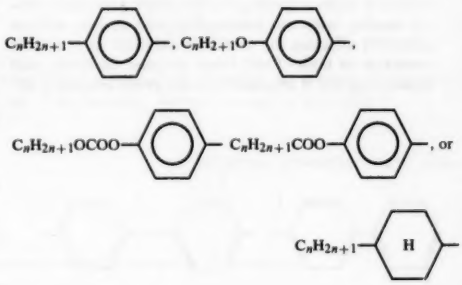
U.S. Cl. 252—299.63 **20 Claims**

1. A nematic liquid crystal compound of the general formula



wherein

$R^1 = R^2$ and each is



with

n = 1 to 16

$R^3 = n\text{-}C_mH_{2m+1}$ with

m = 3 to 14.

4,519,937

ELECTROACTIVE POLYMERS

Yoram S. Papir, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 304,410, Sep. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 264,915, May 18, 1981, abandoned. This application Apr. 22, 1982, Ser. No. 370,231

Int. Cl.³ H01B *1/00*

U.S. Cl. 252—500 **42 Claims**

1. A tractable electroactive polymer which comprises a charged polymer backbone of recurring units of a fused 6,6-membered nitrogen-containing unsaturated heterocyclic ring system and charge compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing a reversible oxidation or a reversible reduction or both to form said charged polymer backbone.

4,519,938
ELECTROACTIVE POLYMERS

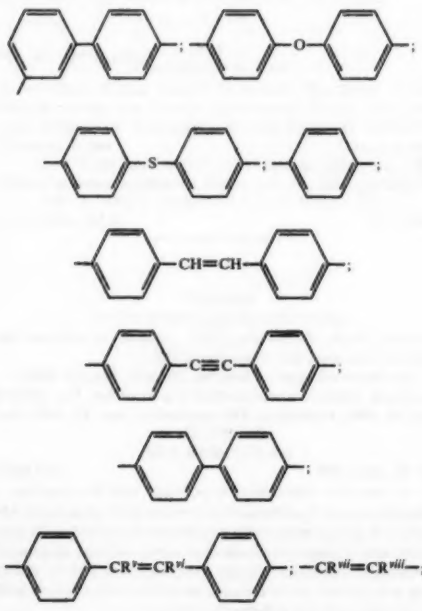
Yoram S. Papir, Emeryville, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,531
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—500 25 Claims

1. A tractable electroactive polymer comprising:

a linear charged polymer backbone and a sufficient concentration of charge compensating ionic dopant(s) associated therewith, wherein said linear polymer backbone is capable of undergoing reversible oxidation or reversible reduction or both to form said linear charged polymer backbone, said linear polymer backbone comprises diradical repeat units selected from the group consisting of a heterocyclic ring system including at least one Group 5B or Group 6B atom, wherein none of the ring carbon atoms is saturated, a heterocyclic ring system including at least one Group 5B or Group 6B atom wherein none of the ring carbon atoms is saturated and a connecting unit, and mixtures thereof, wherein said diradical repeat unit contains no exocyclic double bonds and said diradical unit in the form of a monomeric repeat unit is capable of undergoing reversible oxidation or reversible reduction or both to form a stable ionic species, wherein said ionic species is a charged atomic or molecular species in the condensed phase which maintains said ionic species chemical integrity throughout the course of the chemical process of undergoing reversible oxidation or reversible reduction or both, and wherein said connecting unit is a conjugated system or atom or group of atoms which maintain π orbital overlap with the heterocyclic ring system without adversely affecting the reversible oxidation or reversible reduction or both of said linear polymer backbone, said connecting unit is selected from the group consisting of:

—O—; —S—; —CH=CH; —C≡C—;



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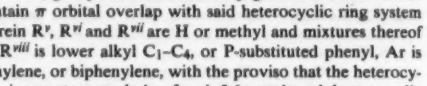


and atoms, groups of atoms and conjugated molecules which maintain π orbital overlap with said heterocyclic ring system wherein R^{v}, R^{vi} and R^{vii} are H or methyl and mixtures thereof and R^{viii} is lower alkyl C_1–C_4, or P-substituted phenyl, Ar is phenylene, or biphenylene, with the proviso that the heterocyclic ring system excludes fused 5,6-membered heterocyclic ring systems wherein two heteroatoms are in the 5-membered ring.

4,519,939
PARTICULATE DOPED POLYACETYLENE

Jürgen Hocker; Hans K. Müller, and Bruno Broich, all of Bergisch-Gladbach, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 26, 1982, Ser. No. 362,100
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1981, 3113330
Int. Cl.[3] H01B 1/06
U.S. Cl. 252—500 3 Claims

1. A process for the production of a suspension suitable for forming films and coatings by spray-drying of doped polyacetylene particles, said process comprising introducing acetylene into an organic solvent which is a hydrocarbon or halogenated hydrocarbon and contains, as a Ziegler catalyst, a catalytic amount of a reaction product of (1) a metal compound of Groups IVb, Vb, VIb, VIIb, or VIII of the Periodic Table and (2) an aluminium alkyl or aluminum alkyl halide to thereby form shaped polyacetylene particles suspended in the organic solvent, deactivating the Ziegler catalyst, and p- or n-doping the polyacetylene particles by adding a dopant additive.

4,519,940
TRIAZOLE ELECTROACTIVE POLYMERS

Albert H. Schroeder, Richmond; Peter Denisevich, Jr., El Cerrito; Shigeto Suzuki, San Francisco, and Victor P. Kurkov, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Nov. 17, 1982, Ser. No. 442,398
Int. Cl.[3] H01B 1/00
U.S. Cl. 252—500 19 Claims

1. A tractable electroactive polymer which comprises a charged polymer backbone of recurring units of a monocyclic N-substituted 1,3,4-triazole, wherein the 1-nitrogen atom is substituted with lower alkyl of 1–6 carbon atoms or phenyl, and a sufficient concentration of a charge-compensating ionic dopant associated therewith, wherein the polymer backbone is capable of undergoing reversible oxidation or reversible reduction or both to form the charged polymer backbone.

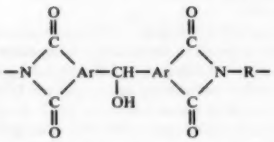
4,519,941
METAL-FILLED POLYIMIDE/POLYEPOXIDE BLENDS OF IMPROVED ELECTRICAL CONDUCTIVITY

Stephen P. Anderson, South Gate, Calif., assignor to National Starch and Chemical Corporation, Bridgewater, N.J.

Continuation-in-part of Ser. No. 521,791, Aug. 9, 1983, abandoned. This application Jun. 15, 1984, Ser. No. 621,360
Int. Cl.[3] A01B *1/06*
U.S. Cl. 252—514 20 Claims

1. A metal-filled polyimide/polyepoxide blend, characterized by its improved conductivity after curing over the blend without polyepoxide, which comprises:

(a) about 25–50% of a carbinol-containing polyimide consisting essentially of a repeat unit having the structure:



wherein Ar is the same or different aromatic radical with the two pairs of attached carbonyl groups situated on adjacent carbon atoms in the Ar radical and R is a divalent aliphatic, cycloaliphatic, aromatic, or heterocyclic radical;

(b) about 1–35% of a liquid substituted or unsubstituted alphatic, cycloaliphatic, aromatic, and/or heterocyclic polyepoxide containing at least two epoxy groups; and

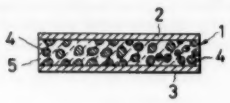
(c) about 15–74% of an organic solvent for the polyimide; the percentages of (a), (b), and (c) being by weight and totaling 100%; and

(d) about 45–90% by weight of an electrically conductive noble metal powder; the percentage of (d) being by weight based on the total weight of the polyimide and polyepoxide.

4,519,942
SEMICONDUCTIVE CERAMIC COMPOSITIONS WITH A NONLINEAR VOLT-AMPERE CHARACTERISTIC, AND PROCESS FOR PREPARING COHERENT BODIES OF SUCH COMPOSITIONS

Nobutatsu Yamaoka, Harunamachi; Akira Tsukada, Takasaki, and Kazuo Sasazawa, Maebashi, all of Japan, assignors to Taiyo Yuden Co., Ltd., Tokyo, Japan

Filed Jul. 6, 1981, Ser. No. 280,801
Claims priority, application Japan, Jul. 30, 1980, 55-104713
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—520 2 Claims



1. A semiconductive ceramic composition with a nonlinear volt-ampere characteristic, particularly well suited for varistors, consisting essentially of:

(a) from about 90.000 to about 99.989% $SrTiO_3$;

(b) from about 0.001 to about 5.000% of at least one metal oxide, for making the composition semiconductive, selected from the group consisting of Nb_2O_5, Ta_2O_5, WO_3, La_2O_3, CeO_2, Nd_2O_3, Pr_6O_{11}, Dy_2O_3, Y_2O_3, and Sm_2O_3; and

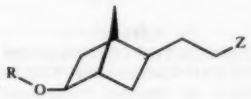
(c) from about 0.010 to about 5.000% of at least one other metal oxide, for improving the nonlinear volt-ampere characteristic of the composition, selected from the group consisting of V_2O_5, Cr_2O_3, CuO, Cu_2O, MoO_3, and MnO_2.

4,519,943
5-ALKOXYBICYCLO[2.2.1]HEPTANE-2-OXYPROPANE DERIVATIVES AND USES THEREOF IN AUGMENTING OR ENHANCING THE AROMAS OF PERFUME COMPOSITIONS, COLOGNES AND PERFUMED ARTICLES

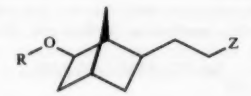
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean; William L. Schreiber, Jackson; Patrick Whelan, Matawan, and Marie R. Hanna, Hazlet, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,794
Int. Cl.[3] A61K *7/46*; C07C *47/34, 35/24*
U.S. Cl. 252—522 R 21 Claims

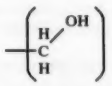
1. A compound having the structure selected from the group consisting of:



and



(wherein R represents C_1–C_3 alkyl and wherein Z represents one of the moieties, carbinol having the structure:



or carboxaldehyde having the structure:

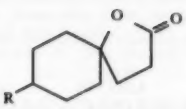
2. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes and perfumed articles comprising the step of adding to said consumable material an aroma augmenting or enhancing quantity of at least one compound defined according to claim 1.

4,519,944
SPIROLACTONES AS ODORANTS

Robert T. Dahill, Holmdel; Kenneth L. Purzycki, Lake Parsippany, and Erlinda F. Golle, Passaic, all of N.J., assignors to Givaudan Corporation, Clifton, N.J.

Continuation-in-part of Ser. No. 411,145, Aug. 25, 1982, abandoned. This application May 16, 1983, Ser. No. 495,212
Int. Cl.[3] A61K *7/46*; C07D *307/94*
U.S. Cl. 252—522 R 27 Claims

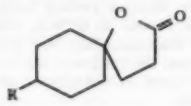
1. A method for improving the odor of a fragrance composition which comprises adding thereto a compound of the formula



I

wherein R represents an alkyl group of from one to four carbon atoms.

6. A compound having the formula



wherein R is selected from the group consisting of methyl, ethyl and sec-butyl.

4,519,945

PROCESS FOR THE PREPARATION OF A PRECIPITATE OF CASEIN AND WHEY PROTEIN

Henricus A. W. E. M. Ottenhof, Wageningen, Netherlands, assignor to Stichting Nederlands Instituut Voor Zuivelonderzoek, Netherlands

Filed Dec. 16, 1983, Ser. No. 562,102

Claims priority, application Netherlands, Dec. 21, 1982, 8204923

Int. Cl.[3] **A23J** *1/20, 1/22*

U.S. Cl. 260—119 **13 Claims**

1. A process for the preparation of a precipitate of casein and whey protein from a milk product containing casein and whey protein, which comprises

(a) adjusting the pH of said milk product to a value above 6.8,

(b) heating the product obtained in step (a) at a temperature and for a time at least sufficient to denature the whey protein,

(c) cooling the product obtained in step (b) to a temperature below 65° C.,

(d) reducing the pH of the cooled solution to a value below 5.4 and

(e) isolating the resulting precipitate.

4,519,946

STEROIDS

Jean G. Teutsch, Pantin; Germain Costerousse, Saint-Maurice; Daniel Philibert, La Varenne Saint Hilaire, and Roger Deraedt, Pavillons sous Bois, all of France, assignors to Roussel Uclaf, Paris, France

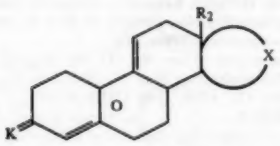
Division of Ser. No. 595,267, Mar. 30, 1984, abandoned, which is a division of Ser. No. 386,967, Jun. 10, 1982, abandoned, which is a continuation-in-part of Ser. No. 338,077, Jan. 9, 1982, Pat. No. 4,386,085. This application May 25, 1984, Ser. No. 614,440

Claims priority, application France, Jan. 9, 1981, 81 00272

Int. Cl.[3] **C07J** *53/00*

U.S. Cl. 260—239.55 R **7 Claims**

1. A compound selected from the group consisting of 19-nor steroids and 19-nor-D-homo-steroids of the formula



I

wherein R_2 is a hydrocarbon of 1 to 8 carbon atoms, X is selected from the group consisting of pentagonal ring and a hexagonal ring optionally substituted and optionally containing a double bond, and K is a ketone blocked in the form of a ketal, thioketal, oxime or methyloxime.

4,519,947

PROCESS FOR PRODUCING ANTHRAQUINONE COMPOUNDS

Makoto Hattori, Osaka; Akihiro Taguma, Hyogo; Toshihiko Morimitsu, and Akira Takeshita, both of Osaka, all of Japan, assignors to Sumitomo Chemical Co., Ltd., Osaka, Japan

Filed Oct. 4, 1983, Ser. No. 539,031

Claims priority, application Japan, Oct. 4, 1982, 57-175173; Oct. 5, 1982, 57-175568

Int. Cl.[3] **C07C** *97/24, 143/665*

U.S. Cl. 260—371 **28 Claims**

1. A process for producing 1,4-diaminoanthraquinone-2,3-disulfonic acid or an alkali metal salt or ammonium salt thereof which comprises reacting a 1,4-diamino-2,3-dihalogenoanthraquinone with a sulfonating agent selected from the group consisting of an alkali metal sulfite, an alkali metal hydrogensulfite, ammonium sulfite and ammonium hydrogensulfite in an aqueous medium at a temperature of 50° C. or above and at a pH of 4 to 11 in the presence of at least one of a quaternary ammonium compound and a quaternary phosphonium compound, said sulfonating agent being used in an amount of 2.0 to 5.0 moles per mole of the 1,4-diamino-2,3-dihalogenoanthraquinone.

4,519,948

PROCESS FOR OXIDIZING A PHENOL TO A P-BENZOQUINONE

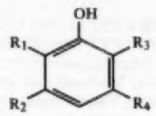
Chao-Yang Hsu, Media, and James E. Lyons, Wallingford, both of Pa., assignors to Sun Tech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 423,985, Sep. 27, 1982, abandoned. This application Aug. 30, 1983, Ser. No. 527,891

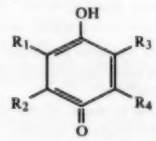
Int. Cl.[3] **C07C** *45/16, 49/64*

U.S. Cl. 260—396 R **8 Claims**

1. In the process of oxidizing phenol or a substituted phenol of the formula



wherein R_1, R_2, R_3, and R_4 may be the same or different, and are selected from the group consisting of hydrogen, halo, cyano, C_1–C_{12} alkyl, C_1–C_{12} alkoxy, phenyl, naphthyl, phenylalky, alkylphenyl, C_7–C_{16} phenoxy, or C_7–C_{16} phenalkoxy; and R_1 and R_2, or R_3 and R_4 may be joined to form an aliphatic, aryl, or hetero ring selected from the group consisting of naphthalene, quinoline, isoquinoline, chroman, and indole, to benzoquinone or a substituted benzoquinone of the formula



where R_1, R_2, R_3, and R_4 are as defined above, with a copper salt catalyst selected from the group of halides and nitrates, the improvement which comprises carrying out the reaction in a C_1 to C_6 nitroalkane as solvent and promoting the catalyst with a base selected from alkali metal phenoxides, and secondary or tertiary lower alkyl amines.

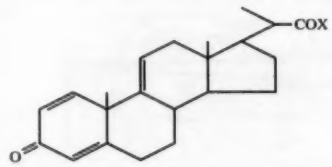
4,519,949

STEROID-20-CARBOXYLIC ACID COMPOUNDS AND A PROCESS FOR THEIR PRODUCTION

Wolfgang Preuss, Monheim, Fed. Rep. of Germany, assignor to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 262,971, May 12, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 423,276
Claims priority, application Austria, May 16, 1980, 2629/80
Int. Cl.³ C07J 9/00
U.S. Cl. 260—397.1 11 Claims

1. Δ1,4,9(11)-pregnatrien-3-ohne-20-carboxylic acid compounds corresponding to formula I below:



(I)

in which X is selected from the group consisting of halogen and NH_2.

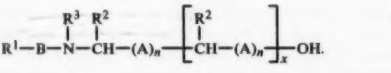
4,519,950

ACETAL GROUP-CONTAINING NON-IONIC SURFACTANTS

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jan. 16, 1981, Ser. No. 225,570
Int. Cl.³ C09F 1/00
U.S. Cl. 260—404 7 Claims

1. A composition of matter having the formula:



wherein R^1 is the residue of a hydrophobic monofunctional aliphatic or aliphatic-aromatic compound selected from the group consisting of at least one of an alkyl, alykylaryl, arylalkyl, and alkylarylalkyl group; wherein each alkyl group has about 6 to about 30 carbon atoms: B is C=O; and wherein R^2 is hydrogen or alkyl of 1 to about 4 carbon atoms; R^3 is alkyl or substituted alkyl of 1 to about 4 carbon atoms; A is the residue of a hydrophilic oxyalkylene polymer which is derived from different alkylene oxides or different hydrophilic oxyalkylene polymers at least one of said polymers being derived from different alkylene oxides wherein said alkylene oxides have 2 to 4 carbon atoms and said polymers are the reaction product of said alkylene oxides with an active hydrogen compound having at least 2 active hydrogen atoms; x is an integer of 1 to 20; and n is individually selected from integers such that the molecular weight is up to about 1000.

4,519,951

SELECTIVE REDUCTION OF FATTY MATERIALS USING A SUPPORTED GROUP VIII METAL IN EGGSHELL DISTRIBUTION

Gail M. Qualeatti, Palatine, and Blaise J. Arena, Des Plaines, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 5, 1983, Ser. No. 511,052
Int. Cl.³ C11C 3/12, 1/00
U.S. Cl. 260—409 16 Claims

1. A method for the selective reduction of a fatty material comprising contacting under hydrogenation conditions the fatty material with hydrogen and a catalyst which comprises a zerovalent Group VIII metal dispersed with an eggshell distribution on a porous support selected from the group consisting of alumina, silica, thoria, magnesia, titania, and combinations thereof, and recovering the selectively reduced product.

4,519,952

PROCESS FOR SEPARATING FATTY ACIDS FROM UNSAPONIFIABLES

Michael T. Cleary, Elmhurst; Santi Kulprathipanja, Hoffman Estates, and Richard W. Neuzil, Downers Grove, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 474,999, Mar. 14, 1983, , which is a continuation-in-part of Ser. No. 407,672, Aug. 12, 1982, Pat. No. 4,404,145, which is a continuation-in-part of Ser. No. 333,250, Dec. 21, 1981, abandoned, which is a continuation-in-part of Ser. No. 297,453, Aug. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 252,745, Apr. 10, 1981, Pat. No. 4,329,280. This application Sep. 19, 1983, Ser. No. 533,463
The portion of the term of this patent subsequent to Sep. 13, 2000, has been disclaimed.
Int. Cl.³ C11C 1/08
U.S. Cl. 260—419 8 Claims

1. A process for separating a fatty acid from a feed mixture comprising a fatty acid and an unsaponifiable compound, said process comprising contacting said feed mixture at separation conditions with a molecular sieve comprising a crystalline silica having a silica to alumina mole ratio of at least 12, thereby selectively retaining said fatty acid, and removing the remainder of the feed mixture from the molecular sieve, said fatty acid being recovered from said molecular sieve by displacement at displacement conditions with a displacement fluid soluble in said feed mixture and having a polarity index of at least 3.5.

4,519,953

PROCESS FOR PREPARING STILBENEDICARBONITRILES

Lorenz Heiss, Hofheim am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Mar. 29, 1984, Ser. No. 594,547
Claims priority, application Fed. Rep. of Germany, Apr. 2, 1983, 3312164
Int. Cl.³ C07C 121/64
U.S. Cl. 260—465 H 1 Claim

1. A process for preparing stilbenedicarbonitriles which comprises dimerizing o- or p-cyanobenzyl chloride in a polar aprotic solvent in the presence of an excess of alkali metal hydroxide powder with loss of hydrogen chloride.

4,519,954

LEACH RESISTANT CATALYST USEFUL FOR THE DIMERIZATION OF ACRYLIC COMPOUNDS

James D. Burrington, Richmond Hts.; Fred A. Pesa, Aurora; Elizabeth A. Maher, University Hts., and Robert K. Grasselli, Chagrin Falls, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 29, 1982, Ser. No. 454,508
Int. Cl.³ C07C 121/20, 121/26, 55/14, 57, 13
U.S. Cl. 260—465.8 D 22 Claims

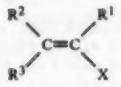
1. A process for the dimerization of an acrylic compound selected from the group consisting of acrylonitrile, methacrylonitrile, acrylamide, methacrylamide, acrolein, methacrolein, acrylic acid, methacrylic acid, methyl acrylate, ethyl acrylate and methyl methacrylate, in the liquid phase comprising contacting an acrylic compound with a ruthenium based catalyst in the presence of hydrogen, at a pressure from about 1 psi to about 1500 psi and a temperature in the range of about 50° C. to about 400° C., wherein the catalyst comprises an inorganic oxide catalyst support, trivalent pendant atoms covalently bonded to the support and ruthenium complexed with the

trivalent pendant atoms, wherein the ruthenium is in the form of a complex represented by the formula:

$$RuL_a^1L_b^2L_c^3$$

wherein L^1 is a mono or bidentate ligand selected from F, Cl, Br, I, 2,4-pentanedionate, or mixtures thereof,

wherein L^2 is one or more of acetonitrile, propionitrile, benzonitrile, water and a group of the formula:



wherein X is CN, CO_2R^4, CHO or $CONR_2^4$ and R^1, R^2, R^3 and R^4 are independently selected from C_{1-16} alkyl, C_{6-16} aryl and H;

wherein L^3 is R_3^5P, R_3^5As, R_3^5Sb, R_3^6N, R_3^5Bi, R_2^6S and R_2^6O, or mixtures thereof wherein each R^5 is a C_{1-16} group independently selected from alkyl, aryl, alkoxy, aryloxy, dialkylamino and diarylamino and R^6 is independently selected from C_{1-16} alkyl, C_{6-16} aryl or H; and

wherein

a is 0 to 3;

b is 0 to 6;

c is 0 to 6; and

a+b+c is at least 2; and

wherein L^1, L^2 and L^3 are additively bonded to the Ru with 4 to 6 ligating bonds.

4,519,955

METHOD FOR OPTICAL RESOLUTION OF DL-α-AMINO ACID OR (±)-α-PHENYLETHANESULFONIC ACID

Ichiro Chibata, Saita; Shigeki Yamada, Toyonaka; Chikara Hongo, Osaka, and Ryuzo Yoshioka, Kaizuka, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Mar. 2, 1984, Ser. No. 585,767

Claims priority, application Japan, Mar. 16, 1983, 58-43583

The portion of the term of this patent subsequent to Nov. 15, 2000, has been disclaimed.

Int. Cl.³ C07C *143/26;* **C07B** *19/00;* **C07D** *207/16, 209/20*

U.S. Cl. 260—501.12 **35 Claims**

1. A compound comprising an α.(S)-amino acid and α-phenylethanesulfonic acid which is α-amino acid.α-phenylethanesulfonate, exclusive of p-hydroxyphenylglycine.α-phenylethanesulfonate.

3. The compound claimed in claim 1, in which the α-amino acid is selected from the group consisting of alanine, arginine, valine, leucine, isoleucine, phenylalanine, phenylglycine, tyrosine, trytophan, serine, threonine, proline, cysteine, glutamic acid, aspartic acid, histidine, ornithine, lysine and citrulline.

4,519,956

PROCESS FOR SELECTIVELY PREPARING ACETIC ANHYDRIDE BY CARBONYLATION OF METHYL ACETATE IN THE PRESENCE OF AN IODIDE-FREE CATALYST SYSTEM

Jiang-Jen Lin, Round Rock, and Roger G. Duranleau, Georgetown, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 21, 1983, Ser. No. 515,748

Int. Cl.³ C07C *51/56, 51/12*

U.S. Cl. 260—549 **8 Claims**

1. A process for the production of acetic anhydride which comprises reacting methyl acetate with carbon monoxide in the presence of an iodide-free bimetallic catalyst system comprising a ruthenium-containing compound from the group consisting of one or more oxides of ruthenium, ruthenium complexes with carbonyl-containing ligands and ruthenium carbonyl or hydrocarbonyl derivatives, a quaternary phosphonium salt and a cobalt-containing compound at a temperature of between 150° C. and 350° C. and a pressure of between 2000 psi and 7000 psi.

4,519,957

VARIABLE-VENTURI CARBURETOR

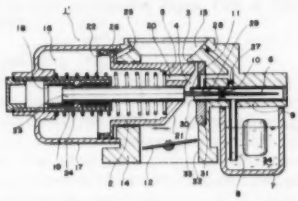
Takaaki Ito, and Takashi Kato, both of Mishima, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 429,431, Sep. 30, 1982, abandoned. This application Sep. 13, 1984, Ser. No. 650,566

Claims priority, application Japan, Dec. 9, 1981, 56-196885

Int. Cl.³ F02M *9/06*

U.S. Cl. 261—44 C **3 Claims**



1. A variable-venturi carburetor comprising: a barrel; a throttle valve mounted in the interior, downstream poriton of said barrel; a bridge formed in the upstream poriton of said barrel and projecting outwardly into the interior of said barrel; a suction chamber provided on the side of said barrel adjacent to a venturi section formed in the interior of said barrel between said throttle valve and said bridge; a suction piston slidably fitted into said suction chamber and adapted to move back and forth in the venturi section; said suction piston having a piston head; said piston head designed at its upstream portion to be overlapped by said bridge in the idling condition; and metering neddle projecting outwardly from said suction piston head; a well; a main nozzle formed at the front end of said well and projecting outwardly a predetermined distance into the venturi section; a notch formed on the downstream side of said nozzle; a main jet formed in said well; said metering needle inserted through said main nozzle into said main jet; a float chamber; said well being connected to said float chamber; a fuel guide positioned in the venturi section adjacent to said nozzle and havnig a raised surface formed below said nozzle and offset inwardly from said notch, and having a tapered surface at its downstream portion which merges smoothly into the barrel wall to provide a smooth transition for the flow of fuel.

4,519,958

FUEL FLOW METERING APPARATUS

Willard Z. Kendig, Yettem, Calif., assignor to Kenna Research Corporation, Tustin, Calif.

Division of Ser. No. 387,901, Jun. 14, 1982, Pat. No. 4,482,507. This application Jun. 29, 1984, Ser. No. 626,367

Int. Cl.³ F02M *7/22*

U.S. Cl. 261—50 A **4 Claims**

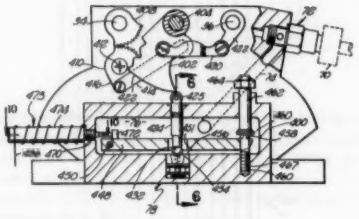
1. A fuel flow metering apparatus for a carburetor responsive to activation of an operator controlled throttle for mixing a fuel from a storage tank with air for burning in an internal combustion engine, the carburetor defined by a carburetor housing having an air intake opening, an air-fuel discharge opening and an air-fuel mixing passageway extending through the housing between the air intake opening and the air discharge opening for drawing air in through the air intake opening in response to a partial vacuum created by the operation of the internal combustion engine and discharging a metered amount of the fuel in the air-fuel mixing passageway, the air-fuel mixture resulting therefrom being drawn through the air-fuel discharge opening into the engine in response to the partial vacuum, the direction of air flow through the housing

defining a flow direction; a fuel reservoir housing defining therein a fuel reservoir having a fuel input port and a fuel discharge port; a fuel dispersion assembly mounted to the housing for dispersing the fuel form the reservoir into the air passing through air-fuel mixing passageway;

a fuel flow metering means for variably regulating the flow of fuel from the fuel reservoir into the fuel dispersion assembly in response to the magnitude of the partial vacuum created by the operation of the internal combustion engine compriaing;

a pivotal metering cam having a variable radius metering surface;

a metering rod extending through the fuel reservoir housing and having a first end postioned to bear against the metering surface and a second end positioned in the fuel reservoir;



a ball valve; and

a first spring positioned in the fuel discharge port to press against the ball valve whereby the ball valve is held against a second end of the reservoir metering rod, the first spring further pressing the reservoir meeting rod to bear against the metering surface, the fuel discharge port having therein a closure surface defined by a generally torus-like, inwardly narrowing, curved mouth transitioning to a frusto-conically tapered inner surface whereby pivotal movement of the metering disk causes longitudinal movement of the metering rod to variably increase and decrease the spacing between the ball valve and the closure surface whereby the flow of fuel through the fuel discharge port is increased or decreased respectively.

4,519,959

GAS-LIQUID CONTACTING APPARATUS

Tatsuro Takeuchi, 60-38, Miyake-cho, Moriyama, Shiga 524; Shohei Yoshida, 2-1, Aza-higashiyashiki, Yamada, Itami, Hyogo 664, and Kazuhiro Kawai, 201 Takeda Yakuhin Seiunryo, Mitsui-morigatao, Hikari, Yamaguchi 743, all of Japan

Filed Apr. 13, 1983, Ser. No. 484,552

Claims priority, application Japan, Apr. 14, 1982, 57-62917; Feb. 10, 1983, 58-20774

Int. Cl.³ B01F *3/04*

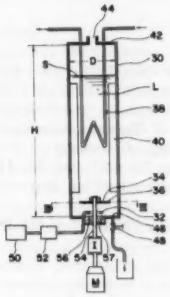
U.S. Cl. 261—93 **20 Claims**

1. A gas-liquid contacting apparatus which comprises, in combination:

a generally cylindrical upright vessel for accommodating a quantity of liquid medium to be agitated by the action of bubbles of gaseous medium moving upwards within the vessel;

at least one perforated distributor in said vessel for supplying the gaseous medium under pressure into the vessel so as to disperse it into the liquid medium in the form of bubbles;

at least one generally disc-shaped rotary disintegrator rotatably mounted in said vessel immediately above said distributor for rotation in a plane perpendicular to the longitudinal axis of said vessel and concentric with the inner peripheral surface of said vessel and having a diameter for defining an annular clearance between the periphery of said disintegrator and the inner peripheral surface of said vessel, said disintegrator having a flat under surface facing the bottom of said vessel for, during the rotation of said disintegrator, causing bubbles of the gaseous medium emerging from said distributor to form a vortex below the flat under surface of said disintegrator, said distributor having a plurality of apertures therein in an annular area around the outer peripheral part of said disintegrator, the radial dimension of said annular area being less than half the radius of said disintegrator, and each of said apertures extending completely through the thickness of said disintegrator from said flat under surface to the upper surface thereof and being defined by peripheral edges of said



disintegrator around said apertures, whereby all the bubbles from said vortex pass upwards through the apertures and are sheared by the peripheral edges of said disintegrator for disintegrating the bubbles into fine bubbles;

a drive shaft extending coaxially into said vessel and having one end positioned exteriorly of said vessel and having said disintegrator mounted on the other end for rotation together with said shaft; and

a drive mechanism connected to said one end of said drive shaft.

4,519,960

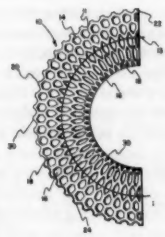
EXPANDED METAL SADDLE TOWER PACKING

B. Layton Kitterman, and Donald L. Glaspie, both of Dallas, Tex., assignors to Glitsch, Inc., Dallas, Tex.

Filed Mar. 10, 1983, Ser. No. 474,534

Int. Cl.³ B01F *3/04*

U.S. Cl. 261—94 **32 Claims**



21. An improved dump packing bed for vapor-liquid contact columns constructed of individual, semi-toroidal elements adapted for stacking one against another in random orientation for the flow of fluids thereacross and a turbulent interface therein, wherein the improvement comprises said semi-toroidal elements being constructed of expanded metal formed from a slotted material blank deformed across orthogonal notional axes to comprise an expanded metal body of varying lateral expansion and a variably expanded lattice of interconnected lands and segmented holes therebetween adapted for receiving

the flow of fluid therethrough and imparting turbulence thereto said interconnected lands of said curved lattice terminating in oppositely disposed arrays of perimeter teeth, and said teeth of said semi-toroidal elements matingly engaging segmented holes of adjacent semi-toroidal elements to secure said engagement during fluid flow through said variably expanded holes therein.

4,519,961

PRODUCTION OF DRY POWDERS OF SUBSTANCES WHICH ARE SENSITIVE TO OXIDATION

Horst Schumacher, Bobenheim, and Paul Grafen, Weisenheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 30, 1982, Ser. No. 413,085

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135329

Int. Cl.[3] **A61J** *5/00;* **B01J** *13/02;* **B05D** *7/00*

U.S. Cl. 264—4.6 **6 Claims**

1. A process for converting an oxygen-sensitive, oil soluble substance into a dry, free-flowing, oxygen-insensitive powder, which comprises:

(a) dispersing said oxygen-sensitive, oil soluble substance in an aqueous solution which contains a film-forming colloid and one or more compounds selected from the group consisting of a mono-, di-, and poly-saccharide to form a dispersion wherein said colloid constitutes the continuous phase;

(b) atomizing said dispersion within the spraying zone of a spray tower to form discrete particles therefrom;

(c) causing said particles, as they form, to contact a hydrophobic spray assistant selected from the group consisting of silanized silica, a metal salt of a higher fatty acid and mixtures thereof in the absence of significant amounts of starch powder, with the newly formed particles being at a temperature during such contact which precludes solidification; said contact being effected by maintaining a uniform distribution of said spray assistant in the spraying zone of said spray tower during atomization of said dispersion therein to form said particles, with the spray assistant being supplied to the spraying zone in an amount of from about 0.02 to 0.15 parts by weight based on the weight of said dispersion;

(d) collecting said particles laden with said hydrophobic spray assistant in a fluidized bed downstream from the spraying zone of said spray tower with said bed being maintained in a fluidized state by an upwardly directed flow of dry air; and

(e) causing said particles to solidify and dry in said fluidized bed by means of the upward flow of dry air through the bed.

4,519,962

METHOD AND SYSTEM FOR SEALING THE EDGES OF INSULATING-GLASS PANELS

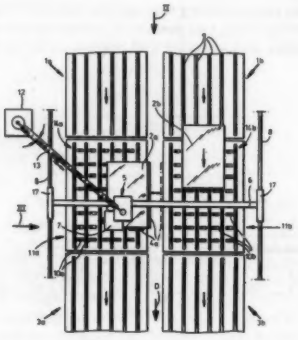
Hubert Schlienkamp, Witten, Fed. Rep. of Germany, assignor to Szabo Maschinenbau GmbH & Co. KG, Radevormwald, Fed. Rep. of Germany

Filed Sep. 16, 1983, Ser. No. 533,643

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234320

Int. Cl.[3] **B29C** *23/00, 27/00;* **B29D** *31/00*

U.S. Cl. 264—40.7 **5 Claims**



1. A method for operating apparatus for sealing edges of assembled sandwiches of two sheets with a peripheral spacer therebetween, said apparatus comprising:

means including first and second conveyors extending longitudinally and horizontally parallel to each other, beneath sealing means, for displacing respective successions of sandwiches to said sealing means;

respective first and second means adjacent said conveyors for positioning the sandwiches longitudinally and transversely relative said conveyors;

said sealing means having a transverse support extending horizontally across both said conveyors and displaceable longitudinally of said conveyors; and a sealing device, including sensing means and an extrusion nozzle displaceable along said support and engageable with edges of the sandwiches on the conveyors for sealing said sandwiches, the method including the steps of:

moving two rows of said sandwiches along said first and second conveyors, positioning said sandwiches on said conveyors, with said means for positioning; and

displacing said device along said support and said support along said conveyors to move the sealing device first around a sandwich on the first conveyor and then around a sandwich on the second conveyor;

said positoning including replacing each sealed sandwich with an unsealed sandwich, while the sealing device seals another of said sandwiches, with alternate and sequential operation of said conveyors.

4,519,963

ELECTROCONDUCTIVE CROSS-LINKED POLYOLEFIN FOAM AND METHOD FOR MANUFACTURE THEREOF

Iwao Yoshida, Kyoto; Takeo Kasanami, Joyo, and Shuji Miura, Uji, all of Japan, assignors to Sanwa Kako Company Limited, Kyoto, Japan

Filed May 17, 1983, Ser. No. 495,406

Claims priority, application Japan, May 17, 1982, 57-81618

Int. Cl.[3] **B29J** *1/02*

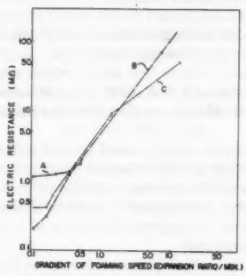
U.S. Cl. 264—45.3 **24 Claims**

1. A method for the manufacture of an electroconductive cross-linked polyolefin foam, which comprises:

kneading 100 parts by weight of a polyolefin, 10 to 30 parts

by weight of particles of a conductive carbon black, and suitable amounts of a foaming agent and a cross-linking agent, and

heating the resultant cross-linkable and foamable composition under atmospheric pressure and at a temperature not



more than 200° C. so that the gradient of foaming speed is maintained at 10 or less, thereby allowing the composition to be cross-linked and foamed without being abruptly foamed or expanded,

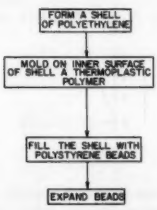
wherein the gradient of foaming speed is the change of the expansion ratio per one minute.

4,519,964

PROCESS FOR PREPARING PLASTIC ARTICLES HAVING AN OUTER SHELL AND INNER FOAM CORE

Haim Rosen, Tel-Aviv, Israel, assignor to Rotoplas, Ltd., Jerusalem, Israel

Filed Jan. 19, 1984, Ser. No. 572,044
Int. Cl.³ B29D *27/00*
U.S. Cl. 264—45.4 **6 Claims**


FORM A SHELL OF POLYETHYLENE
MOLD ON INNER SURFACE OF SHELL A THERMOPLASTIC POLYMER
FILL THE SHELL WITH POLYSTYRENE BEADS
EXPAND BEADS

1. A process for preparing plastic articles having a rigid outer shell filled with a core of foamed polystyrene, comprising:

(a) forming a shell of rigid polyethylene;

(b) molding into the inner surface of the shell a layer of a thermoplastic polymer selected from copolymers of ethylene and a member selected from the group consisting of alkylacrylates, alkylmethacrylates and vinyl esters;

(c) filling the shell with pre-expanded polystyrene beads and expanding the beads to fully occupy the hollow of the shell.

4,519,965

INTERNAL MOLD RELEASE AGENT FOR USE IN REACTION INJECTION MOLDING

Ronald P. Taylor, Coraopolis; Mark E. Cekoric, North Versailles; John E. Dewhurst, Oakdale, and Saad M. Abouzahr, Coraopolis, all of Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Aug. 23, 1984, Ser. No. 643,612
Int. Cl.³ C08G *18/14*
U.S. Cl. 264—51 **34 Claims**

1. A process for the production of optionally cellular, polyurethane elastomer moldings by reacting a reaction mixture comprising

(I) a polyisocyanate,

(II) an isocyanate-reactive polymer having a molecular weight of about 1800 to 12,000,

(III) about 5 to 50% by weight, based on the weight of component (II) of a chain extender comprising a sterically hindered aromatic diamine and

(IV) an internal mold release agent mixture comprising

(a) about 0.5 to 10% by weight, based on the weight of components (II) and (III) of a zinc carboxylate containing 8 to 24 carbon atoms per carboxylate group and

(b) a compatibilizer comprising a member selected from the group consisting of nitrogen-containing, isocyanate-reactive, acyclic compounds and nitrogen-containing, isocyanate-reactive polymers in an amount sufficient to solubilize the zinc carboxylate so that when the internal mold release agent mixture is in admixture with components (II) and (III), the zinc carboxylate possesses improved resistance to precipitation,

said reaction mixture being processed as a one-shot system by the RIM process at an isocyanate index of about 70 to 130.

4,519,966

LOW-CONTAMINATION ALN CRUCIBLE FOR MONOCRYSTAL PULLING AND METHOD

Fritz Aldinger, Rodenbach; Richard Keilberth, Kleinheubach, and Waltraud Werdecker, Hanau, all of Fed. Rep. of Germany, assignors to W. C. Heraeus GmbH, Hanau, Fed. Rep. of Germany

Filed Dec. 20, 1983, Ser. No. 563,647
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1982, 3248103
Int. Cl.³ C04B *35/58*; C30B *15/10, 35/00*
U.S. Cl. 264—56 **7 Claims**

1. A method of making a low-contamination crucible for pulling of monocrystals, particularly semiconductor compounds of Group III and Group V elements, consisting essentially of at least 97% by weight aluminum nitride and 0.5% to 3% by weight boron nitride, comprising the steps of:

(1) milling a particle mixture of aluminum nitride and hexagonal boron nitride to a powder with a maximum particle diameter of less than 200 micrometers;

(2) cold isostatically pressing said powder over a mandrel at a pressure of approximately 2400 bars to form a crucible shape;

(3) thereafter placing said crucible shape in a pressure-controlled sintering chamber;

(4) evacuating said sintering chamber to a pressure of less than 1 millibar;

(5) introducing nitrogen as a substantially inert gas atmosphere;

(6) raising the pressure of said substantially inert gas to at least 5 millibars;

(7) raising the temperature in said sintering chamber to 1300° C.;

(8) thereafter raising the substantially inert gas pressure to 140 millibars;

(9) further raising the temperature in said sintering chamber to 1800° C. within one hour and permitting the substantially inert gas pressure to rise to 190 millibars;

(10) holding said crucible at 1800° C. for two hours; and

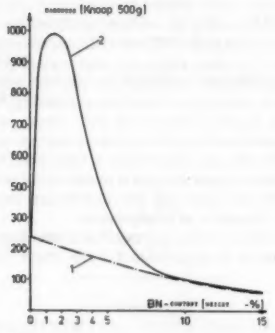
(11) allowing the crucible to cool to room temperature.

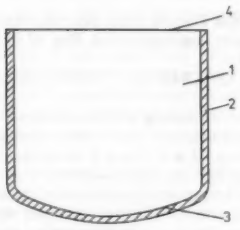
3. A method of making a low-contamination crucible for pulling of monocrystals, particularly semiconductor compounds of Group III and Group V elements, consisting essentially of at least 97% by weight aluminum nitride and 0.5% to 3% by weight of a rare earth oxide, comprising the steps of:

(1) milling a particle mixture of aluminum nitride and at least one rare earth oxide to a powder with a maximum particle diameter of less than 200 micrometers;

(2) cold isostatically pressing said powder over a mandrel at a pressure of approximately 2400 bars to form a crucible shape;

(3) thereafter placing said crucible shape in a pressure-controlled sintering chamber;





(4) evacuating said sintering chamber to a pressure of less than 1 millibar;

(5) introducing nitrogen as a substantially inert gas atmosphere;

(6) raising the pressure of said substantially inert gas to at least 5 millibars;

(7) raising the temperature in said sintering chamber to 1300° C.;

(8) thereafter raising the substantially inert gas pressure to 140 millibars;

(9) further raising the temperature in said sintering chamber to 1800° C. within one hour and permitting the substantially inert gas pressure to rise to 190 millibars;

(10) holding said crucible at 1800° C. for two hours; and

(11) allowing the crucible to cool to room temperature.

4,519,967

METHOD OF MAKING A SILICON METAL CONTAINING ARTICLE

Gary M. Crosbie, Dearborn, and Gregory T. Bretz, Canton, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Oct. 24, 1983, Ser. No. 544,942

Int. Cl.³ B28B *1/26, 1/38;* **C04B** *35/02*

U.S. Cl. 264—86 **5 Claims**

1. A method of making a silicon metal containing article characterized in the following steps:

forming a water vehicle first slurry which contains silicon metal particles, said first slurry being substantially free of ions which would cause a flocculation of said silicon metal particles;

forming an organic vehicle based second slurry which contains a compound which has an ion which would cause flocculation of silicon metal particles contained in a water vehicle slurry, said organic vehicle of said second slurry being effective to suppress formation of ions by said ion forming compound;

adding said first and said second slurries to form a castable silicon metal particle containing slurry in which said compound contained in said organic vehicle can form ions when in contact with said water vehicle, which ions cause flocculation of silicon metal particles;

introducing said castable silicon metal particle containing slurry into a casting mold;

permitting said castable silicon metal particle containing slurry to set up in said casting mold by flocculation of said silicon metal particles by said ions of said compound; and

removing said casting mold after said castable silicon metal particle containing slurry has set up, thereby to form the silicon metal containing article.

4,519,968

MANUFACTURING DIMENSIONALLY STABLE SHAPED HOLLOW SECTIONS FROM ALIPHATIC POLYAMIDES AND THEIR APPLICATIONS

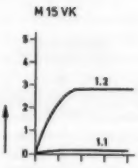
Klaus Michel, and Armin Gude, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Hüls AG, Marl, Fed. Rep. of Germany

Filed Feb. 7, 1983, Ser. No. 464,772

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1982, 3206131; Nov. 25, 1982, 3243612

Int. Cl.³ B29D *23/04;* **B29C** *17/07*

U.S. Cl. 264—178 R **5 Claims**



1. A method for manufacturing shaped, hollow sections of polyamide plastics dimensionally stable under influence of fuels for internal combustion engines and having a given diameter consisting of:

(a) extruding a hot melt of aliphatic polyamides having at least 5 carbon atoms per carbon amide group or polyamides from an aliphatic dicarboxylic acid and an aliphatic diamine which together have at least 12 carbon atoms through a tube die;

(b) sizing said hot melt through a first gauging device having an inside diameter greater than said given diameter;

(c) cooling said shaped, hollow sections obtained in a cooling bath;

(d) removing the cooled, shaped hollow sections from the cooling bath; and

(e) sizing the cooled, shaped hollow sections adiabatically through a second gauging device having an inside diameter less than said given diameter whereby said given diameter is achieved.

4,519,969

STRETCHED FLUORINE TYPE FILM AND METHOD FOR MANUFACTURE THEREOF

Kunio Murakami, Kyoto, Japan, assignor to Unitika Ltd., Hyogo, Japan

Filed Sep. 10, 1984, Ser. No. 649,003
Claims priority, application Japan, Sep. 9, 1983, 58-166937
Int. Cl.³ C08J *5/18*
U.S. Cl. 264—210.7 **22 Claims**

1. A biaxially stretched film containing at least 90 mol % of ethylene-tetrafluoroethylene copolymer, having a value of crystallization property, ΔT, expressed by the equation

$$\Delta T = T_m - T_c$$

wherein T_m (melting point) stands for the peak melting temperature (°C.) found when a sample is heated at a temperature increase rate of 20° C./minute using differential scanning calorimeter (DSC), and

T_c (crystallizing temperature during fall of temperature) stands for the peak crystallizing temperature (°C.) found when the sample is cooled at a temperature decrease rate of 80° C./minute from the melting point plus 20° C. using said DSC,

of not less than 15° C. and not more than 60° C.,

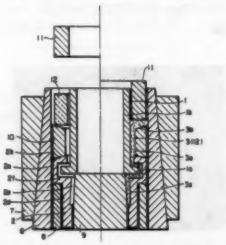
prepared by a method comprising heating a thermoplastic resin containing at least 90 mol % of ethylene-tetrafluoroethylene copolymer to form a molten resin, extruding the molten resin through a die, and cooling the extruded molten resin at a cooling speed of at least 70° C./second in the range of the melting point minus 10° C. to the melting point minus 100° C. to thereby form a film while simultaneously biaxially stretching said film to at least two times the original size in each of the longitudinal and lateral directions.

4,519,970

METHOD FOR PRODUCING INSULATED PIPE JOINT

Takeo Inoue, and Takashi Shirazawa, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 250,789, Apr. 3, 1981, Pat. No. 4,411,457. This application Aug. 4, 1983, Ser. No. 502,391
Claims priority, application Japan, Apr. 14, 1980, 55-51152
Int. Cl.³ B29C *17/00, 3/00*
U.S. Cl. 264—261 **1 Claim**



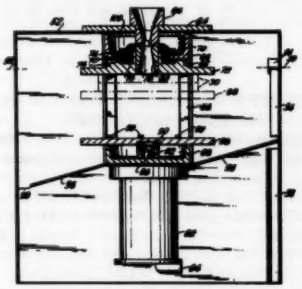
1. A method of producing an insulated pipe joint comprising the steps of: providing a first tubular member having a flange portion at one end thereof; providing a second tubular member having a cap portion at one end thereof adapted to receive said flange portion of the first tubular member with a gap therebetween; providing a mold comprising a molding flask, a split wall portion adapted to be received in said molding flask, a supporting member for supporting said second tubular member, a holding member for holding said first tubular member, an auxiliary wall portion for constructing an outer circumferential insulating portion and a flanged insulating portion, and a pressure member; heating said mold and said second tubular member; placing said second tubular member upon said supporting member; heating said first tubular member; disposing said flange portion of said first tubular member in said cap portion of said second tubular member; placing said first tubular member upon said holding member; placing said auxiliary wall portion upon said cover portion of said second tubular member; providing and heating a preliminary molded member formed of insulating material; placing said preliminary molded member upon said auxiliary wall portion; and placing said pressure member upon said preliminary molded member and applying a pressure to said preliminary molded member to cause said insulating material to flow into said gap.

4,519,971

FRONT LOADING CENTRIFUGAL SPIN CASTER

Leonard S. Schaer, Greenwich, Conn., assignor to Tekcast Industries, Inc., New Rochelle, N.Y.

Division of Ser. No. 425,895, Sep. 28, 1982, Pat. No. 4,478,567. This application Mar. 26, 1984, Ser. No. 593,556
Int. Cl.³ B29C *5/04*
U.S. Cl. 264—311 **3 Claims**



1. A method of spin casting a mold in a spin caster, comprising:

loading a mold through a side of the spin caster housing onto a vertically movable bottom plate adapted to rotate about a substantially vertical axis, and underneath a vertically stationary top plate adapted to rotate about said substantially vertical axis;

moving the bottom plate vertically upward to cause the mold to contact the top plate;

applying a rotational force to the top plate which propagates through the mold to the bottom plate to thus cause the top plate, the bottom plate and the mold to rotate together;

introducing a liquid material into the mold through an aperture in the top of the top plate;

terminating the rotational force;

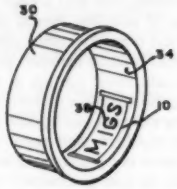
moving the bottom plate vertically downward; and

removing the mold through the side of the housing.

4,519,972
METHOD FOR USE OF PATTERN TRANSFERS IN ROTOMOLDING

Michael J. Stevenson, 1312 Say Rd., Santa Paula, Calif. 93060

Filed May 18, 1983, Ser. No. 495,754
Int. Cl.³ B29C 5/04
U.S. Cl. 264—245 6 Claims



1. The method of decorating products formed by a rotational molding process which comprises;

(a) preparing a decorative pattern transfer by coating a sheet film carrier with a silicon release agent, and overcoating said release agent coating with a pattern coating comprising a mixture of from 5 to 85 weight percent of pigments dispersed in a hydrocarbon wax having a melting point from about 150 to about 280 degrees F. and distributed on said film carrier in a predetermined pattern;

(b) positioning said decorative pattern transfer against a preselected area of an inside wall of a rotation mold;

(c) burnishing said decorative pattern coating onto said inside wall of said rotational mold, and removing said sheet film carrier;

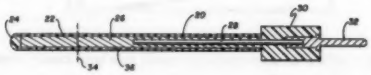
(d) charging said mold with particulate molding resin; heating said mold and conducting the rotational molding of the product with heating to coalesce the particulate molding resin; and

(e) recovering from the mold a product having a decorative or printed surface on a preselected area of its exterior surface.

4,519,973
ION SELECTIVE MEMBRANES FOR USE IN ION SENSING ELECTRODES

Patrick T. Cahalan, Maple Grove; Allan H. Jevne, Anoka, and Eric J. Fogt, Maple Grove, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 3, 1983, Ser. No. 519,937
Int. Cl.³ B29D 3/00; G01N 27/46; A61B 5/00
U.S. Cl. 264—267 21 Claims



1. A method of producing an ion-sensing electrode from a tube of solid swellable plastic having a proximal end, a distal end, an outer wall and a first lumen, comprising the following steps:

dissolving an ion-selective material in a solvent which is a swelling agent for said solid swellable plastic;

subsequently soaking at least a portion of said tube in said solvent in which said ion-selective material has been dissolved;

after said soaking step drying said tube until said solvent evaporates; and

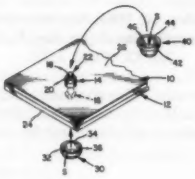
after said drying step filling the first lumen of said tube with an electrolyte gel,

sealing the distal end of the first lumen of said tube and inserting a first electrode into the first lumen of said tube.

4,519,974
METHOD AND APPARATUS FOR APPLYING A SEALANT TO EXPOSED FASTENERS

Thomas H. Bravenec, Bedford; Roger L. Boyd, Mesquite, and Robert R. Ferenc, Dallas, all of Tex., assignors to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 12, 1983, Ser. No. 522,711
Int. Cl.³ B29C 1/00
U.S. Cl. 264—279 15 Claims



1. A method of applying a sealant over an object comprising: depositing in the interior cavity of a rigid sealant-retaining shell an amount of sealant substantially equal to the difference in the volume of the interior cavity of the shell and the volume of the object to be covered; applying the shell and sealant over the object rotating the shell with the boundary of the shell in contact with the object; while said shell is disposed adjacent said object allowing the sealant to cure; removing the shell after the sealant has cured said applying including gripping a flange extending radially from said shell and spaced from portions of said shell defining a mouth.

4,519,975
METHOD OF MANUFACTURE OF PLASTIC ARTICLE POSSESSING A WET APPEARANCE

Eberhard H. Neumann, Spartanburg, S.C., assignor to American Hoechst Corporation, Somerville, N.J.

Filed Jul. 25, 1983, Ser. No. 516,838
Int. Cl.³ B29C 17/07
U.S. Cl. 264—526 9 Claims

1. A process for the production of biaxially oriented plastic articles possessing a "wet" appearance comprising injecting a small amount of water effective to produce said "wet" appearance, at a temperature of at least 33° F. into a parison prior to or simultaneously with expansion of said parison in an otherwise conventional stretch blow molding process.

4,519,976

METHOD OF MAKING PLASTIC ARTICLES

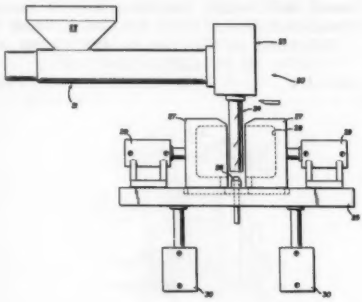
Albert R. Uhlig, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 854,555, Nov. 25, 1977, Pat. No. 4,305,902, which is a continuation of Ser. No. 670,936, Mar. 26, 1976, abandoned, which is a continuation of Ser. No. 461,361, Apr. 16, 1984, abandoned. This application Jun. 30, 1980, Ser. No. 164,665

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ B29C *17/07*

U.S. Cl. 264—540 2 Claims



1. In a method of making a plastic article by known plastic forming techniques performed exteriorly of an orifice from which the material issues in a formable thermoplastic state, the improvements comprising:

(1) providing a body of non-oriented plasticized thermoplastic material which is at a first temperature lower than a desired second temperature which is conducive to orientation;

(2) applying a pressure of at least 20,000 psi to said body and thus

(3) advancing the body of material by progressively expressing it at said pressure of at least 20,000 psi toward said orifice while said body of material is initially at said first temperature

(4) repeatedly and progressively non-linearly shearing said body of material during the performance of step (3) to multidirectionally orient the same,

(5) the performance of steps (3) and (4) raising the temperature of the body of material to said second temperature conducive to orientation, and

(6) issuing said body of material, while still at a temperature conducive to orientation, from said orifice for further processing while it is still multi-directionally oriented as a result of the performance of step (4).

4,519,977

METHOD FOR MAKING A PLASTIC CONTAINER

Kiyoshi Kawaguchi, Yokohama, and Muneki Yamada, Ishikawa Fujisawa, both of Japan, assignors to Toyo Seikan Kaisha Limited, Tokyo, Japan

Filed Mar. 30, 1983, Ser. No. 480,308

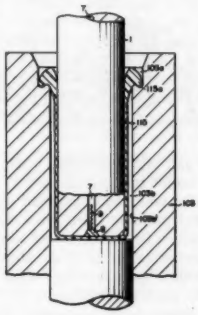
Claims priority, application Japan, Sep. 27, 1982, 57-166640; Sep. 27, 1982, 57-166641; Sep. 27, 1982, 57-166642; Nov. 10, 1982, 57-196038

Int. Cl.³ B29C *17/03, 17/04;* B29D *9/04*

U.S. Cl. 264—550 6 Claims

1. A method of manufacturing a tubular plastic container having a flange portion, a sidewall portion and a bottom wall portion, at least said sidewall portion being molecularly oriented, comprising the steps of

bringing a peripheral edge portion, corresponding to said flange portion, of a flat blank of a molecularly orientable plastic into engagement with a shoulder portion of a die, said blank having a practically uniform thickness and having a temperature not higher than the molecularly orientable temperature range of said plastic, said engagement being effected by employing a die having a first cavity with an inside diameter practically equal to an outside diameter of said flange portion and a second cavity with an inside diameter practically equal to an outside diameter of said sidewall portion, said first cavity and said second cavity being connected to each other through a die shoulder portion comprising a step portion constituted by an annular groove connecting to an inner surface of said first cavity and an annular land located at an inner side of said annular groove, said blank having a diameter slightly larger than said inside diameter of said first cavity, and tightly placing said blank into said first cavity of said die, without applying axial pressure to said peripheral edge portion of said blank while forming said sidewall portion;



introducing said blank into said second cavity of said die while compressing a central portion of said blank substantially corresponding to said bottom wall portion by means of a first plunger and an opposing second plunger, a side surface of said first plunger being kept at a temperature substantially in the molecularly orientable temperature range of said plastic;

forming said sidewall portion from material of said blank extending out from between said first plunger and said second plunger by bringing said material into contact with said side surface of said first plunger, thereby forming a hollow molded piece; and

discharging a pressurized fluid to the inside of said hollow molded piece while withdrawing said first plunger in order to expand said sidewall portion until said sidewall portion is brought into contact with said inner surface of said second cavity held at a temperature not higher than the lower limit of said molecularly orientable temperature range, thereby cooling said sidewall portion to harden.

4,519,978

SECONDARY HEAT TRANSFER CIRCUIT FOR A NUCLEAR REACTOR

Alain Brachet, Orsay; Jacques Figuet, Aix en Provence; Joël Guidez, Connaux, and Noël Lions, Manosque, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Sep. 21, 1983, Ser. No. 534,280

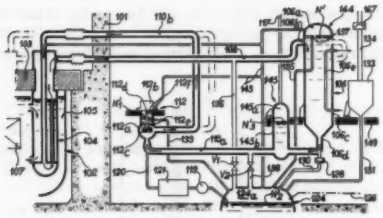
Claims priority, application France, Sep. 22, 1982, 82 15958

Int. Cl.³ G21C *15/00;* G21D *1/00*

U.S. Cl. 376—307 7 Claims

1. In a liquid metal-cooled nuclear reactor having a reactor vessel containing liquid metal and at least one heat exchanger located in said vessel for extracting heat from said liquid metal, a secondary heat transfer circuit, said circuit comprising said heat exchanger and a vertical steam generator outside said

vessel, said steam generator having an exchange area therein, an outgoing pipe connecting an outlet tube of said heat exchanger to at least one intake tube of said steam generator, a return pipe connecting at least one outlet tube of said steam generator to an inlet tube of said heat exchanger, said circuit containing a secondary liquid metal, a pump for circulating said secondary liquid metal, said pump being positioned in said return pipe, an upstream buffer tank and a downstream buffer tank disposed in said circuit respectively upstream and downstream of said exchange are of said steam generator, and a storage tank for said secondary liquid metal which can be linked with the remainder of the circuit, wherein said downstream buffer tank is disposed in said return pipe between said



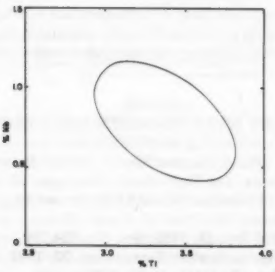
steam generator and said circulating pump, in said immediate vicinity of said outlet tube of said steam generator, each of downstream buffer tank, said upstream buffer tank and said storage tank being partially filled with said secondary liquid metal so as to define a free level of said secondary liquid metal therein, and a neutral gas in the space above said free level so as to provide a neutral gas covering, means being provided for establishing a first neutral gas pressure above the free level of said secondary liquid metal contained in said downstream buffer tank and means are also provided for simultaneously establishing a second neutral gas pressure above said free level of said secondary liquid metal contained in said storage tank and in said upstream buffer tank, said second pressure being lower than said first pressure.

4,519,979

NICKEL-CHROMIUM-COBALT BASE ALLOYS AND CASTINGS THEREOF

Stuart W. K. Shaw, Sutton Coldfield, England, assignor to INCO Europe Limited, London, England

Filed Jun. 6, 1983, Ser. No. 501,612
Int. Cl.³ C22C *19/05*
U.S. Cl. 420—448 **5 Claims**



1. A nickel-chromium-cobalt alloy, consisting essentially, in percent by weight, of about 20 to about 23% chromium, about 17 to about 23% cobalt, about 1 to 2.5% tungsten, about 0 to about 0.5% molybdenum, about 0.4 to about 1.2% niobium, about 0.6 to about 1.4% tantalum, about 2.95 to about 3.85% titanium, about 1.6 to about 2.8% aluminum, about 0.3 to about 1.3% hafnium, about 0.005 to about 1% zirconium, about 0.001 to about 0.05% boron, and about 0.01 to about 0.25% carbon, the balance, apart from impurities, being nickel, wherein the contents of niobium, hafnium, titanium and aluminum are so correlated that they satisfy the expression (the Correlation Factor):

$$28327\ Nb+804\ Hf+36956\ Ti+115057\ Al-6676\ Nb^2-564\ Hf^2-4847\ Ti^2-54349\ Al^2+8392\ Al^3-5255\ (Nb\times Ti)\geqq 153$$

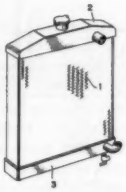
123.

4,519,980

FIN MATERIALS FOR AUTOMOBILE RADIATORS

Hajime Sasaki, and Shinichi Nishiyama, both of Tsuchiura, Japan, assignors to Hitachi Cable, Ltd., Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,243
Int. Cl.³ C22C *9/02*
U.S. Cl. 420—474 **4 Claims**



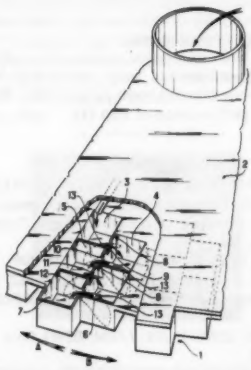
1. A fin material for automobile radiators consisting essentially of from 0.001 to 0.005% by weight of lead; from 0.03 to 0.08% by weight tin or cadmium; and the remainder of copper.

4,519,981

APPARATUS FOR BRINGING A LIQUID SAMPLE SUCCESSIVELY INTO CONTACT WITH A NUMBER OF REAGENTS

Jean Guigan, Paris, France, assignor to Inovelf, Paris, France

Division of Ser. No. 384,703, Jun. 3, 1982, Pat. No. 4,463,097.
This application May 16, 1984, Ser. No. 610,739
Claims priority, application France, Jun. 5, 1981, 81 11158
Int. Cl.³ G01N *35/00, 21/01*
U.S. Cl. 422—64 **4 Claims**



1. Apparatus for bringing a liquid sample successively into contact with a number of reagents, said apparatus comprising:

a rotor,

a series of intercommunicating cells carried by said rotor, the number of cells in said series being at least three and at

least equal to the number of reagents, which are placed in said cells beforehand,

means for for rotating said rotor alternately in opposite directions, and

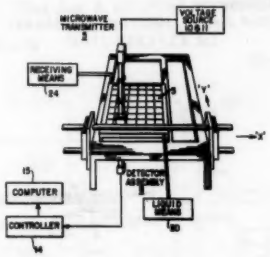
means for effecting flow from one cell circumferentially into another cell of said series when said rotor is rotating in a first direction but preventing reverse flow thereto from said another cell to said one cell of said series, such that a liquid sample successfully contacts the reagents in said at least three cells in sequence by rotating said rotor alternately in opposite directions.

4,519,982

TWO DIMENSIONAL MICROWAVE CHEMICAL FLOOD TESTING MEANS AND METHOD

Lorne A. Davis, Jr., and Helen K. Haskin, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,922
Int. Cl.³ E21B *49/00*
U.S. Cl. 422—68 **5 Claims**



1. A microwave chemical flood scanner comprising:

a test cell having an entry port and an exit port and containing a porous medium, said test cell having side dimensions which are substantially greater than a thickness dimension of said test cell,

liquid source means for providing different liquids to said entry port,

means for receiving the different liquids from said exit port,

transmitter means for providing a beam of microwave energy when energized,

receiver means, spatially related to said transmitter means in a manner so that said test cell may be permitted to be interposed between said transmitting means and said receiving means, for receiving a beam of microwave energy after it has passed through said test cell and providing a signal corresponding to a characteristic of at least one liquid in said porous medium in said test cell,

means for energizing said transmitting means,

means for moving said transmitting means and said receiving means while maintaining their spatial relationship in a manner so that the beam of microwave energy will pass through said test cell at a plurality of predetermined locations that define a two dimensional pattern on said test cell,

calibration curve means for deriving and storing a calibration curve for each predetermined location, and

means for providing a graphical representation of the liquid content of said porous medium in said test cell in accordance with the signal from the receiving means, stored calibration curves, and the positioning of the transmitter means and receiver means in relation to the locations on the test cell;

said moving means includes

first mounting means for having said test cell mounted upon it for holding said test cell in a fixed position,

second and third mounting means, for having the transmitter means mounted on the second mounting means and for having the receiving means mounted on the third mounting means in a manner so that they are aligned with each other and having sufficient space between them so that said test cell may be interposed between said transmitter means and said receiver means,

first means for moving said second and third mounting means in unison along an X axis,

fourth and fifth mounting means having the first moving means mounted thereon,

second means for moving the fourth and fifth mounting means along a Y axis, which is perpendicular to the X axis,

and means for controlling the movement of the second and third mounting means and the fourth and fifth mounting means so that the transmitter means and the receiver means will stop temporarily at predetermined locations on the test cell for the microwave irradiation through the porous medium at that location; and

said liquid means includes:

pump means for pumping a non-corrosive liquid,

a crude oil, or a substitute, source, a surfactant source, a polymer source and a brine source,

first valve means connecting said pump means to said crude oil source, to said surfactant source, to said polymer source and to said brine source for controlling the liquid provided by said pump means to be provided to either the crude oil or substitute source, the surfactant source, the polymer source, or the brine source so as to displace crude oil from the crude oil source, surfactant from the surfactant source, polymer from the polymer source, or brine from the brine source;

second valve means connected to the crude oil source, to the surfactant source, to the polymer source, to the brine source and to the entry port of said test cell and cooperating with the first valve means for directing the brine, the polymer, the surfactant, or the crude oil or its substitute, into said test cell; and

the liquid receiving means includes:

third valve means for cooperating with said first and second valve means, and connected to the exit port of said test cell three for providing the liquid flowing from the sample cell to an appropriate container means or a plurality of container means.

4,519,983

METHOD AND DEVICE FOR DETERMINING THE ORGANIC CARBON CONTENT OF A SAMPLE

Jean Espitalie, Le Vesinet; Marcel Madec, Suresnes, both of France; Paul Leplat, Leuven, and Jacques Paulet, Emines, both of Belgium, assignors to Institut Francais du Petrole, Rueil-Malmaison, France and Société Labofina S.A., Brussels, Belgium

Division of Ser. No. 219,616, Dec. 24, 1980, Pat. No. 4,352,673.
This application Jul. 26, 1982, Ser. No. 401,595
Claims priority, application France, Dec. 28, 1979, 79 32019
Int. Cl.³ G01N *31/12*
U.S. Cl. 422—78 **8 Claims**

1. A device for determining the total amount of organic carbon contained in a sample of sediment, comprising:

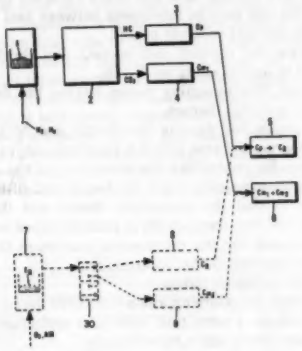
first heating means for heating in an inert atmosphere, a sample to a first temperature wherein at least a fraction of carbon containing organic material is cracked therein;

first measuring means for measuring only the amount of organic carbon contained in at least a fraction of effluents produced in said first heating means during cracking;

second heating means for heating the sample in an oxidizing atmosphere to a second temperature at most equal to said first temperature wherein the residual organic material is oxidized;

second measuring means separate from said first measuring means for measuring the amount of organic carbon contained in the effluent resulting from the oxidation of the organic carbon containing material heated in said second heating means; and

processing means connected to said first and second measuring means for deriving the total organic carbon content of



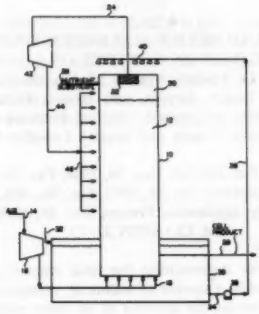
the sample from the measurements performed by said first and second measuring means.

4,519,984

APPARATUS FOR CARRYING OUT SPARGED REACTION

Donald O. Hitzman, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 18, 1982, Ser. No. 340,147
Int. Cl.³ B01J *1/00*
U.S. Cl. 422—196 **21 Claims**



19. Apparatus for carrying out a sparged reaction, comprising:

(a) at least one vertically disposed reaction chamber having gas-impermeable walls;

(b) means for introducing a sparging gas under pressure into the bottom of said reaction chamber;

(c) means for separating and withdrawing said sparing gas from said reaction chamber adjacent the upper end thereof; and

(d) means for passing the thus separated sparging gas in indirect heat exchange with the outside surface of at least the upper portion of said reaction chamber.

4,519,985

USE OF ACTIVATED CARBON TO REMOVE DISSOLVED ORGANICS FROM URANIUM LEACHATE

Bruce D. Wells, Pittsburgh, Pa., and Du'Bois J. Ferguson, Houston, Tex., assignors to Calgon Carbon Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1980, Ser. No. 129,540
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—6 **1 Claim**

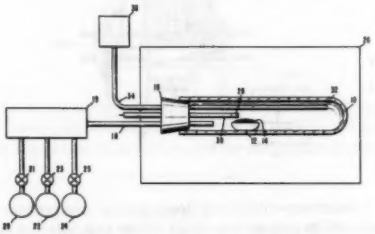
1. A process for selectively removing dissolved organic components from a uranium leachate solution which comprises passing said leachate solution through a bed of granular activated carbon wherein the activated carbon has a net pore volume of at least 0.40 cc/g for those pores having a pore diameter of from 35 to about 1000 Å.

4,519,986

PROCESS FOR PREPARATION OF ULTRAPURE THORIUM FLUORIDE

Ricardo C. Pastor, Manhattan Beach, and Remedios K. Chew, Long Beach, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jan. 28, 1982, Ser. No. 343,637
Int. Cl.³ C01F *15/00*
U.S. Cl. 423—19 **6 Claims**



1. A process for preparing ultrapure thorium fluoride having minimized water and water-derived impurities, comprising the steps of:

(a) reacting thorium oxide with a predetermined amount of aqueous hydrofluoric acid to form a solid reaction product;

(b) drying said solid reaction product under controlled heating to form a hydrated thorium fluoride with a predetermined amount of hydration; and

(c) exposing said hydrated thorium fluoride to a reactive atmosphere comprising hydrofluoric acid vapor and a selected fluoride compound in the gas phase at a predetermined elevated temperature for a predetermined period of time to thereby remove substantially all of said water and water-derived impurities from said hydrated thorium fluoride and to thereby provide said ultrapure thorium fluoride.

4,519,987

TREATMENT OF OXIDIC MATERIALS

Michael Robinson, Wooton, England, assignor to Laporte Industries Limited, London, England

Filed Sep. 12, 1983, Ser. No. 531,265
Claims priority, application United Kingdom, Oct. 9, 1982, 8228932; Jan. 8, 1983, 8300473
Int. Cl.³ C01G *41/00, 33/00, 35/00;* C01F *7/56*
U.S. Cl. 423—60 **8 Claims**

1. A process for the treatment of a mineral containing metal oxides capable of reacting to form volatile chlorides at temperatures of from 450° C. to 1100° C., the Gibbs Free Energy of Chlorination of at least one of the metal oxides being at least 5×4184 Joules per mole of chlorine reacted different from at least one other of the metal oxides, to remove therefrom at least one metal oxide, comprising establishing a fluidised bed of

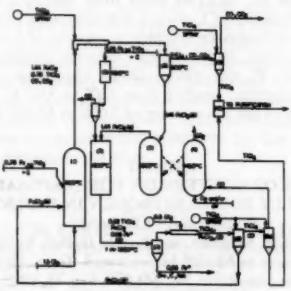
particles of the mineral in admixture with a quantity of particles of carbon in excess of that required to react with the oxygen present in the at least one metal oxide to be removed and as oxygen added to the bed, maintaining the temperature of the fluidised bed at from 450° C. to 1100° C. and such that the at least one metal oxide to be removed reacts to form a volatile chloride, passing a free chlorine containing gas having a concentration of chlorine of from 20% to 85% by volume into the fluidised bed, passing a feed of oxidic mineral into and through the fluidised bed and removing treated solids from the fluidised bed, maintaining an expanded bed depth greater than 2.75 m and an expanded bed height to diameter ratio of at least 4:1 and maintaining a zone of at least 0.25 m in depth, measured downwardly from the expanded bed surface, in which there is substantially no free chlorine and removing the volatile chloride formed from the fluidised bed.

4,519,988

TWO STAGE CHLORINATION OF TITANIFEROUS ORE

Semyon D. Fridman, Randallstown, Md., assignor to SCM Corporation, New York, N.Y.

Filed Aug. 8, 1984, Ser. No. 638,854
Int. Cl.³ C01G *23/02*
U.S. Cl. 423—76 **4 Claims**



1. A process for chlorinating an iron-containing titaniferous ore to produce $TiCl_4$ which comprises:

(a) chlorinating from 70 to 80% by weight of said ore in a first chlorination zone with a carbonaceous reductant and with chlorine alone or in combination with $FeCl_3$ to yield a primary stream containing $TiCl_4$, $FeCl_2$ and oxides of carbon,

(b) separating $FeCl_2$ from said primary stream;

(c) chlorinating the balance of said ore in a second chlorination zone using said $FeCl_2$ as a chlorinating agent and a carbonaceous reductant under dilute phase conditions to yield a secondary stream containing $TiCl_4$, metallic iron, unused $FeCl_2$ and oxides of carbon;

(d) separating the metallic iron and $FeCl_2$ from said secondary stream; and,

(e) combining the product $TiCl_4$ from said primary and secondary streams.

4,519,989

REMOVAL OF ORGANIC CONTAMINANTS FROM BAUXITE AND OTHER ORES

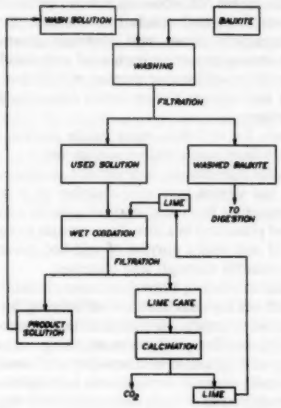
Alan Pearson, and Paul J. The, both of Murrysville, Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 22, 1983, Ser. No. 468,312
Int. Cl.³ C01F *7/06*
U.S. Cl. 423—121 **18 Claims**

1. A process for making a Bayer process liquor having a decreased concentration of organic contaminants, said process comprising

(a) washing bauxite in a slurry comprising the bauxite and an aqueous wash solution containing caustic soda, sodium carbonate or mixtures thereof in an amount up to about 80 g/l total alkali content (expressed as sodium carbonate equivalent), thereby to remove organic contaminants from said bauxite,

(b) separating from the slurry a used solution containing degradation products of said organic contaminants, and



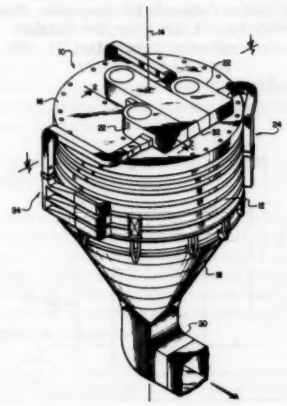
(c) dissolving the washed bauxite in a caustic solution containing caustic soda or a mixture of caustic soda and sodium carbonate in a concentration of about 100–400 g/l total alkali content (expressed as sodium carbonate equivalent), thereby to produce Bayer process liquor.

4,519,990

SPRAY DRYER FOR THE PURIFICATION OF A GAS

Paul M. Bevilaqua, Dublin, Ohio, and Stanley J. Stachura, Woodland Hills, Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 24, 1983, Ser. No. 497,617
Int. Cl.³ B01D *1/16*
U.S. Cl. 423—210 **20 Claims**



1. A spray dryer apparatus for contacting a hot gas stream containing gaseous impurities with an aqueous medium containing an absorbent for the impurities to produce a gas stream

of reduced impurity content and dry powder products, said apparatus comprising:

a chamber formed symmetrically about a vertical axis;

atomizer means located in an upper portion of said chamber for introducing a finely dispersed spray of said aqueous medium;

conduit means for delivering said hot gas stream to said chamber;

gas injection means for receiving a major portion of said hot gas stream from said conduit means and introducing it circumferentially about said atomizer means, said gas injection means imparting both axial and angular velocity components to said major portion of said hot gas stream whereby said hot gas stream swirls downwardly through said chamber;

bypass means for withdrawing a minor portion of said hot gas stream from said conduit means; and

duct means for introducing said withdrawn minor portion of said hot gas stream into said chamber at a tangent to a radius extending from said vertical axis, in a substantially horizontal plane and in a direction counter to the direction of swirl of said major portion of said hot gas stream passing downwardly through said chamber.

18. A method of treating a hot gas stream containing gaseous impurities with an aqueous medium containing an absorbent for the impurities to produce a gas stream of reduced impurity content and dry powder products comprising:

introducing said aqueous medium into a chamber formed symmetrically about a vertical axis, said aqueous medium being introduced as a finely dispersed spray into an upper portion of said chamber;

introducing a major portion of the hot gas stream containing gaseous impurities into said chamber and circumferentially about said finely dispersed spray, said major portion of hot gas being introduced in a downwardly descending swirl through said chamber; and

introducing a minor portion of the hot gas stream into said chamber about the periphery thereof, at a tangent to a radius extending from said vertical axis, in a substantially horizontal plane and in a direction counter to the direction of swirl of the major portion of hot gas passing through said chamber.

4,519,991

ENRICHMENT IN HYDROGEN SULPHIDE OF GASES CONTAINING IT

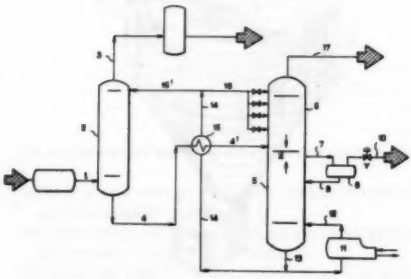
Olivier Oliveau, Lescar, and Claude Blanc, Pau, both of France, assignors to Societe Nationale Elf Anquitaine, France

Filed Dec. 21, 1983, Ser. No. 565,029

Claims priority, application France, Dec. 21, 1982, 82 21410

Int. Cl.³ B01D *53/34*

U.S. Cl. 423—220 **10 Claims**



1. Improvement in the enrichment of a gas in hydrogen sulphide, comprising selective absorption by a liquid in a primary absorption zone by contacting gas containing H_2S with an absorbent liquid, regeneration of the liquid by heating and/or stripping by an inert gas with liberation of the gases absorbed and recovery of a fraction of the liberated gases, the remainder of the liberated gases being subjected to a second absorption in a secondary absorption zone by a new or regenerated absorbent liquid identical with that utilized in the primary absorption zone, characterized in that the steps of regeneration and secondary absorption are effected in a common operative zone in which there occur simultaneously: introduction of the liquid from the primary absorption, movement of the gases liberated during regeneration for said recovery and for contact with absorbent liquid, flow of the liquid derived from the secondary absorption and discharge from said operative zone of a fraction of the liberated gases enriched in H_2S.

4,519,992

PROCESS FOR PURIFYING GASES FROM HYDROGEN SULPHIDE

Tofik G. O. Alkhazov, prospekt Kirova, 40, kv. 39, Baku; Jury P. Korotaev, prospekt Lenina, 69, korpus 2, Moscow, and Albert A. Vartanov, ulitsa Michurina, 39, blok 4, kv. 25, Baku, all of U.S.S.R.

Filed May 24, 1984, Ser. No. 613,892

Claims priority, application U.S.S.R., May 26, 1983, 3591260

Int. Cl.³ B01D *53/36*

U.S. Cl. 423—230 **1 Claim**

1. A process for purifying gases from hydrogen sulphide, comprising oxidizing of hydrogen sulphide with oxygen at a volume ratio of hydrogen sulphide to oxygen of 1:1–1.5 on a catalyst containing, % by weight: titanium dioxide—10–30, iron oxide—20–30, zinc oxide—20–25, chromium oxide—2-0–50 at a temperature ranging from 220° to 260° C. and at a space velocity of the gas mixture of 3,000 to 15,000 hr^{-1}.

4,519,993

PROCESS OF CONVERSION FOR DISPOSAL OF CHEMICALLY BOUND NITROGEN IN INDUSTRIAL WASTE GAS STREAMS

Eugene C. McGill, Skiatook, and Ronald D. Bell, Tulsa, both of Okla., assignors to McGill Incorporated, Tulsa, Okla.

Continuation-in-part of Ser. No. 348,840, Feb. 16, 1982, Pat. No. 4,405,587. This application Aug. 15, 1983, Ser. No. 523,644

The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.

Int. Cl.³ C01B *21/00*; B01D *47/00*

U.S. Cl. 423—235 **22 Claims**

1. An improved process for disposing of an industrial waste stream containing chemically bound nitrogen compounds comprising:

burning the industrial waste stream containing chemically bound nitrogen compounds at a temperature greater than about 2000° F. in the presence of a stoichiometric excess of an amount of a reducing agent required for stoichiometric reduction of available oxygen to provide a combustion effluent substantially free of oxides of nitrogen; and

reacting the combustion effluent with an effective amount of a dilute oxygen containing gaseous stream to achieve oxidation of the combustibles present in the combustion effluent at a temperature of about 1600° F. to about 1800° F. and without effecting flame propagation within the dilute oxygen containing gaseous stream to produce an oxidation effluent substantially free of oxides of nitrogen.

4,519,994

PROCESS FOR ABSORPTION OF SO_2 INTO PHOSPHATE ABSORBENT

Lawrence A. Smalheiser, Spring Valley, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 27, 1984, Ser. No. 584,223

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **6 Claims**

1. A method of absorbing sulfur dioxide wherein sulfur dioxide is absorbed into an absorbent comprising an aqueous

solution of an alkali metal phosphate, wherein said method comprises utilizing a pH for the phosphate of no less than about 4.5 and adjusting the molarity of the phosphate absorbent so as to yield an increased absorption of sulfur dioxide in the absorbent.

4,519,995

METHOD OF DESULFURIZING FLUE GASES OF COAL FIRINGS

Herbert Schröfelbauer, Klagenfurt, and Gernot Staudinger, Graz, both of Austria, assignors to Österreichische Draukraftwerke Aktiengesellschaft, Klagenfurt, Austria

PCT No. PCT/AT82/00034, § 371 Date Jul. 11, 1983, § 102(e) Date Jul. 11, 1983

PCT Filed Nov. 19, 1982, Ser. No. 519,775

Claims priority, application Austria, Nov. 19, 1981, 4992/81

Int. Cl.³ B01J *8/00*; C01B *17/00*

U.S. Cl. 423—244 **5 Claims**

1. A method of desulfurizing flue gas generated in a coal-combusting installation operating with dry additives selected from the group consisting of calcium oxide and calcium carbonate wherein coal is fired in a combustion chamber in the presence of the dry additives reacting with sulfur oxide components, then the stream of flue gas having normally a temperature of about 150° C. and being laden with ashes and residual additives is discharged from the combustion chamber and supplied to a dust filter where the flue gas is separated from the ashes and residual additives, comprising the step of increasing the relative moisture of the discharged stream before its entry in the filter by cooling the discharged stream to a lower temperature which exceeds the temperature of condensation point of water present in the stream, thus enhancing reaction of sulfur oxide components still present in the flue gas with the residual additives in the filter.

4,519,996

METHOD FOR ENRICHING AND SEPARATING HEAVY HYDROGEN ISOTOPES FROM SUBSTANCE STREAMS CONTAINING SUCH ISOTOPES BY MEANS OF ISOTOPE EXCHANGE

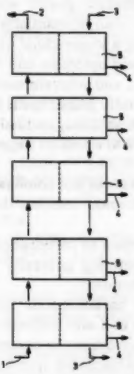
Arndt Knöchel; Ingo Eggers; Bernd Klatte, all of Hamburg, and Rolf-Dieter Wilken, Wentorf, all of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,171

Claims priority, application Fed. Rep. of Germany, Jan. 28, 1982, 3202776

Int. Cl.³ C01B *5/00*

U.S. Cl. 423—249 **48 Claims**



1. Process for enriching and separating heavy hydrogen isotopes having a heavy hydrogen cation of deuterium and/or tritium from substance streams containing them, wherein the respectively present hydrogen isotopes are exchanged in chemical equilibria, comprising:

(a) bringing a protic acid solution containing the deuterium and/or the tritium in contact with a value material selected from the group of open chained polyethers or aminopolyethers, macro-monocyclic or macro-polycyclic polyethers, or macro-monocyclic or macro-polycyclic aminopolyethers, or mixtures of these value materials, in free or proton salt form, to form a reaction product of the heavy hydrogen cation with the value or value salt and bring about enrichment of deuterium and/or tritium in the reaction product;

(b) separating the reaction product containing the value or value salt from the solution; and

(c) releasing from the separated reaction product in the form of deuterium oxide (HDO) and/or tritium oxide (HTO), the hydrogen isotope(s) to be enriched, by regenerating the value or its salt, respectively, and returning the value or its salt for reuse.

4,519,997

METHOD FOR IMPROVING THE INITIAL ACTIVITY OF ACTIVATED HYDRAZINE

Wilfried Fuchs, Halle-Neustadt; Horst Richter, Bad Dürrenberg; Roland Kober, Leuna; Vendelin Kaufmann, Leuna, and Christina Müller, Leuna, all of German Democratic Rep., assignors to VEB-Leuna-Werke "Walter Ulbricht", Leuna, Fed. Rep. of Germany

Filed Mar. 10, 1983, Ser. No. 473,850

Claims priority, application German Democratic Rep., Apr. 22, 1982, 2392177

Int. Cl.³ C02B *1/18*; C23F *11/14, 11/18*

U.S. Cl. 423—265 **10 Claims**

1. A composition for improving the initial activity of activated hydrazine with respect to oxygen dissolved in water, comprising a trivalent cobalt complex with inorganic ligands as complex constituents, and a component selected from the group consisting of 2-amino-4-nitrophenol, 2-acetamino-4-nitrophenol, and mixtures thereof.

4,519,998

PROCESS FOR THE PREPARATION OF A CRYSTALLINE TITANOBOROSILICATE

Kee K. Lam Shang Leen, Cap-Rouge, Canada, assignor to Centre de Recherche Industrielle du Quebec, Quebec, Canada

Filed Aug. 26, 1982, Ser. No. 411,621

Int. Cl.³ C01B *35/10*

U.S. Cl. 423—277 **4 Claims**

1. A method for preparing a crystalline titanoborosilicate molecular sieve material having a composition in terms of mole ratios of oxides as follows:

$$0.9\pm0.2[xR_2O+(1-x)M_{2/n}O]:TiO_2:B_2O_3:ySiO_2.zH_2O$$

wherein R is an alkylammonium cation, M is at least one cation of valence n selected from the group consisting of alkali metal of alkaline earth metal, y is a value of at least 8 up to 500, z is between 0 and 100 and x is a value greater than zero but less than 1, said material being further characterized by an X-ray diffraction pattern comprising the following diffraction lines and their relative intensities:

Interplanar spacing d (A)	Relative intensity
11.1 ± 0.2	W–S
10.05 ± 0.2	W–MS
5.18 ± 0.05	VW–M
4.11 ± 0.05	M–VS
3.83 ± 0.05	M–VS
3.71 ± 0.05	MS–VS
3.64 ± 0.05	MS–S

-continued

Interplanar spacing d (A)	Relative intensity
3.31 ± 0.05	W-S
2.98 ± 0.02	VW-M
2.50 ± 0.02	VW-M
1.99 ± 0.02	VW-M

which method comprises:

(a) providing a reaction mixture comprising:

(1) a titanium-oxide containing material and an alkali metal tetrahydroborate,

(2) a compound of silicon selected from the group consisting of an oxide of silicon and sodium silicate,

(3) a hydroxide of an alkali or alkaline earth metal,

(4) an alkylammonium cation or a precursor thereof, and

(5) water; and

(b) maintaining said reaction mixture under alkaline pH, at a reaction temperature between 25° C. to about 300° C., and for a time sufficient to effect formation of said crystalline titanoborosilicate under autogeneous pressure at the reaction temperature, the composition of the reaction mixture in (a) being such as to provide mole ratios in the following ranges:

$OH^-:SiO_2$: 0.01–11

$R_2O/(R_2O+M_{2/n}O)$: 0.2–0.97

H_2O/OH^-: 10–4000

SiO_2/B_2O_3: 8–4000

SiO_2/TiO_2: 8–400.

4,519,999

WASTE TREATMENT IN SILICON PRODUCTION OPERATIONS

Larry M. Coleman, Tonawanda, N.Y., and William Tambo, Chelmsford, Mass., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 135,878, Mar. 31, 1980, abandoned. This application May 28, 1982, Ser. No. 383,234

Int. Cl.³ C01B *33/18*

U.S. Cl. 423—337 **5 Claims**

1. A process for the enhanced disposal of gaseous and liquid wastes formed during the hydrogenation of metallurgical grade silicon and silicon tetrachloride to produce chlorsilanes, primarily trichlorosilane, disproportionation of such chlorosilanes to produce high purity silane and silicon tetrachloride, and decomposition of said silane in a free space reactor or fluid bed reactor to produce high purity silicon and by-product hydrogen, wherein said wastes are present as a light gas waste including silane and hydrogen, a heavy gas waste including mono, di and trichlorosilane, and a liquid waste including silicon tetrachloride, said process comprising:

(a) separately collecting the light gas waste, heavy gas waste and liquid waste formed in such production operations;

(b) burning said light gas waste in a burner adapted to ensure essentially complete combustion thereof at a temperature not exceeding about 2,000° F. and sufficient to ensure that the silica particulates formed as a result of said combustion are of a size to facilitate subsequent filitration thereof from the resultant combustion product gases;

(c) burning said heavy gas waste with a hydrogen-containing fuel at a temperature not exceeding about 2,000° F. in a separate burner adapted to ensure essentially complete combustion of said waste to hydrogen chloride and silica of a particle size sufficient to facilitate subsequent filtration thereof from the combustion product gases;

(d) burning said liquid waste at a temperature not exceeding about 2,000° F. with a hydrogen-containing fuel in a separate burner adapted to ensure essentially complete combustion of such waste to hydrogen chloride and silica of a particle size sufficient to facilitate subsequent filtration thereof from the combustion product gases;

(e) passing the combustion product gases from said separate burners to two bag filters units in series for separation of silica therefrom;

(f) passing the combustion gases from said filter units to a liquid scrubbing zone for final cleanup ensuring that all particulate matter is removed therefrom, said zone having a stream of liquid withdrawn therefrom and recycled to said zone;

(g) contacting said filtered silica with a hot gas stream to a temperature of at least about 700° F. to ensure desorption of hydrogen chloride therefrom;

(h) passing the filtered silica in said hot gas stream through a cyclone separation zone for recovery of by-product silica;

(i) passing the combustion gases from said scrubbing zone to an absorption zone for contact with water therein thus producting dilute muriatic acid therein;

(j) recovering by-product muriatic acid from said absorption zone;

(k) withdrawing residual combustion product gas from said absorption zone, whereby all of the wastes produced are processed to form useful by-products and clean residual combustion product gas that can be vented to the atmosphere.

4,520,000

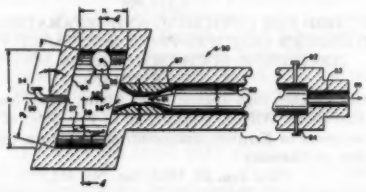
PROCESS FOR PRODUCTION OF CARBON BLACK

John R. Casperson, and Paul D. Hann, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 350,850, Feb. 22, 1982, Pat. No. 4,447,401. This application Feb. 17, 1984, Ser. No. 581,402

Int. Cl.³ C01B *31/02*; C09C *1/48*

U.S. Cl. 423—456 **31 Claims**



1. A method for producing carbon black in a carbon black reactor comprising a precombustion chamber defined by an upstream confining generally planar wall, a downstream confining generally planar wall substantially parallel thereto, and a cylindrical wall having a longitudinal axis, wherein said cylindrical wall connects said upstream and downstream confining generally planar walls, and wherein said upstream and downstream confining generally planar walls lie in planes which are skewed with respect to said longitudinal axis at an angle in the range of from about 30 to about 60 degrees, said method comprising the steps of:

(a) introducing a stream of hot combustion gases tangentially into said precombustion chamber through said cylindrical wall;

(b) introducing a stream of carbonaceous feedstock through said upstream confining generally planar wall into said precombustion chamber;

(c) contacting said carbonaceous feedstock and said hot combustion gases in a non-uniform manner under carbon black formation conditions to convert at least a portion of said carbonaceous feedstock into carbon black;

(d) withdrawing a carbon black-containing smoke from said carbon black reactor; and

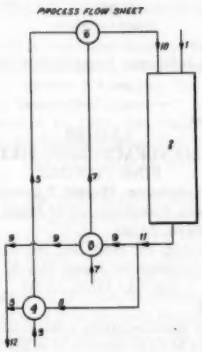
(e) recovering carbon black from said smoke.

4,520,001

PROCESS FOR PRODUCING SOLUTIONS OF ALKALI METAL SILICATE IN A STATIC REACTOR

Jean Metzger, 16, allee Gay Lussac, Pierre Benite, France (69310); Henri Lecouls, 7, avenue Beauregard, St. Genis Laval, France (69230); Philippe Colombé , chemin des Vallons des Mourgues, Le Peyblanc, Aix en Provence, France (13090), and Jean Wojcik, 42, Chemin de la Tassine, St. Genis Laval, France (69230)

Filed Apr. 6, 1983, Ser. No. 482,465
Claims priority, application France, Apr. 16, 1982, 82 06563
Int. Cl.³ C01B *33/32*
U.S. Cl. 423—332 **14 Claims**



1. A process for producing a clear alkali metal silicate solution having an SiO_2/alkali metal oxide weight ratio of 2.5 or less which comprises:

(a) establishing a bed of crystallized silica in a tubular reactor, said silica having an average particle size of between about 0.1 and 2 mm;

(b) introducing an aqueous solution of an alkali metal hydroxide at the top of the reactor to react with a portion of said silica bed at a temperature between about 150° and 240° C. and at a pressure greater than the saturated vapor pressure of the liquid phase of the system at the reaction temperature, said alkali metal hydroxide solution traversing said silica bed at a rate between about 2 and 15 m/hr;

(c) introducing fresh silica at the top of the reactor in an amount to substantially replenish the portion of the silica bed which has reacted with the alkali metal hydroxide, the remaining unreacted part of said bed being sufficient to filter impurities from said silicate solution; and

(d) recovering the resulting clear alkali metal silicate solution from the bottom of the reactor.

4,520,002

METHOD FOR PREPARING ELEMENTAL SULFUR AS A DIFFUSION-RESISTANT GAS AND METHODS FOR ITS USE IN MAKING LIME, SULFUR DIOXIDE AND SULFURIC ACID FROM WASTE GYPSUM

Horace E. Willis, Jr., Houston, Tex., assignor to Merichem Company, Houston, Tex.

Filed Jan. 20, 1984, Ser. No. 572,301
Int. Cl.³ C01B *17/00, 17/42, 17/48, 17/74*
U.S. Cl. 423—522 **8 Claims**

1. A method for preparing elemental sulfur as a coherent diffusion resistant gas for reaction with solid reactants, comprising the steps of:

heating elemental sulfur to the boiling point of sulfur in an enclosed vessel which communicates with a delivery conduit to continuously supply sulfur vapor to said conduit;

super heating said sulfur vapor during transit through said delivery conduit to a temperature of at least about 1270° F.; and

debouching said super heated sulfur vapor from said conduit into a reaction zone to which solid reactant is continuously supplied, whereby said super heated sulfur vapor debouches in the form of a coherent diffusion resistant gas which flows into concentrated contact with said solid reactant.

2. A method for obtaining sulfur dioxide by reacting calcium sulfate with a coherent diffusion resistant gaseous reagent form of elemental sulfur, comprising the steps of:

continuously supplying calcium sulfate to a reaction zone maintained at a temperature of from about 1600° F. to about 2300° F.;

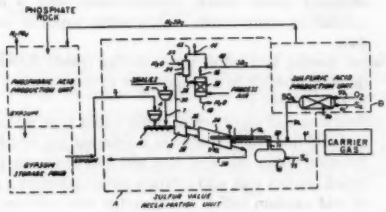
heating elemental sulfur to the boiling point of sulfur in an enclosed vessel which communicates with a delivery conduit to continuously supply sulfur vapor to said conduit;

super heating said sulfur vapor during transit through said delivery conduit to a temperature of at least about 1270° F.; and

debouching said super heated sulfur vapor from said conduit into said reaction zone as a coherent gas which resists diffusion within said reaction zone and thus flows into concentrated contact with said calcium sulfate whereby calcium sulfate is converted by reaction with said sulfur into calcium sulfide and sulfur dioxide.

4. A method for obtaining sulfur dioxide and lime from calcium sulfate, comprising the steps of:

continuously supplying calcium sulfate to a first reaction



zone maintained at a temperature of from about 1600° F. to about 2300° F.;

heating elemental sulfur to the boiling point of sulfur in an enclosed vessel which communicates with a delivery conduit to continuously supply sulfur vapor to said conduit;

super heating said sulfur vapor during transit through said delivery conduit to a temperature of at least about 1270° F.;

debouching said super heated sulfur vapor from said conduit into said first reaction zone as a coherent gas which resists diffusion in said first zone and thus flows into concentrated contact with said calcium sulfate whereby a portion of said calcium sulfate is converted into calcium sulfide and sulfur dioxide; and

supplying said calcium sulfide and said unreacted portion of calcium sulfate to a second reaction zone which is held at a temperature of at least about 1800° F. and maintaining said solids in said second zone for a time sufficient to permit essentially complete reaction between calcium sulfate and calcium sulfide to produce lime and sulfur dioxide.

7. A method for recovering sulfur values from waste by-product gypsum produced by the wet process production of phosphoric acid as sulfur dioxide, comprising the steps of:

dehydrating gypsum to convert gypsum to calcium sulfate;

supplying said calcium sulfate to a first reaction zone maintained at a temperature of from about 1600° F. to about 2300° F.;

heating elemental sulfur to the boiling point of sulfur in an enclosed vessel which communicates with a delivery

conduit to continuously supply sulfur vapor to said conduit;

super heating said sulfur vapor during transit through said delivery conduit to a temperature of from about 1300° F. to about 1800° F.;

debouching said super heated sulfur vapor from said conduit into said first reaction zone as a coherent gas which resists diffusion within said first zone and thus flows into concentrated contact with said calcium sulfate whereby a portion of said calcium sulfate is converted into calcium sulfide and sulfur dioxide; and

supplying said calcium sulfide and said unreacted portion of calcium sulfate to a second reaction zone which is held at a temperature of from about 1800° F. to about 2400° F. and maintaining said solids in said second zone for a time sufficient to permit essentially complete reaction between calcium sulfide and calcium sulfate to produce lime and sulfur dioxide.

8. A method for recovering sulfur values from waste by-product gypsum produced by the wet process production of phosphoric acid and recycling such sulfur values as sulfuric acid for utilization as a reagent in the wet process, comprising the steps of:

dehydrating said gypsum to convert gypsum to calcium sulfate;

supplying said calcium sulfate to a first reaction zone maintained at a temperature of from about 1600° F. to about 2300° F.;

heating elemental sulfur to the boiling point of sulfur in an enclosed vessel which communicates with a delivery conduit to continuously supply sulfur vapor to said conduit;

super heating said sulfur vapor during transit through said delivery conduit to a temperature of from about 1300° F. to about 1800° F.;

debouching said super heated sulfur vapor from said conduit into said first reaction zone as a coherent gas which resists diffusion within said first zone and thus flows into concentrated contact with said calcium sulfate whereby a portion of said calcium sulfate is converted into calcium sulfide and sulfur dioxide;

supplying said calcium sulfide and said unreacted portion of calcium sulfate to a second reaction zone which is held at a temperature of from about 1950° F. to about 2400° F. and maintaining said solids in said second zone for a time sufficient to permit essentially complete reaction between calcium sulfide and calcium sulfate to produce lime and sulfur dioxide;

passing a non-reacting gas in counter-current flow through said second and first zone to collect and remove the sulfur dioxide generated therein from said zones; and

converting said collected sulfur dioxide to sulfuric acid.

4,520,003

METHOD OF MANUFACTURING SULPHUR-TRIOXIDE FOR THE PRODUCTION OF SULPHURIC ACID

Stig A. Petersson, and Ulf C. Waara, both of Skelleftehamn, Sweden, assignors to Boliden Aktiebolag, Stockholm, Sweden

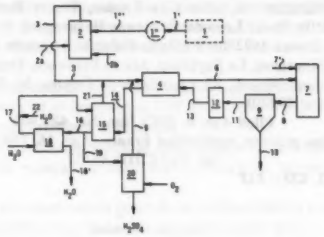
Continuation of Ser. No. 270,012, Jun. 3, 1981, abandoned. This application Sep. 14, 1982, Ser. No. 418,085

Claims priority, application Sweden, Jun. 19, 1980, 8004588

Int. Cl.³ C01B *17/98, 17/74*

U.S. Cl. 423—533 **6 Claims**

1. In a contact method under about atmospheric pressure for the manufacture of sulphur trioxide for the production of sulphuric acid from sulphur-dioxide containing gas, particularly furnace gas obtained from metallurgical processes, by oxidation of sulphur dioxide to sulphur trioxide in the presence of a catalyst and recovering the sulphur trioxide, the improvement comprising separating the sulphur dioxide from the gas and oxidizing to sulphur trioxide with oxygen supplied to the sulphur dioxide in a stoichiometric deficiency in at least one



catalyst bed, said deficiency being in a molar ratio SO_2/O_2 of at least 5.

4,520,004

METHOD OF MANUFACTURING METAL TITANATE FINE POWDER

Satoru Uedaira, Yokohama; Hiroshi Yamanoi, Hiratsuka, and Hidemasa Tamura, Yokohama, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 19, 1983, Ser. No. 524,601

Claims priority, application Japan, Sep. 8, 1982, 57-156315

Int. Cl.³ C01G *23/00*

U.S. Cl. 423—598 **22 Claims**

1. A method for manufacturing a metal titanate fine powder having the formula $MTiO_3$ wherein M is Ba, Sr, or Ca comprising the steps of:

preparing a hydrolysis product of an inorganic titanium compound $TiO_2.xH_2O$ by dissolving said inorganic titanium compound in a neutral or alkaline aqueous solution,

reacting said hydrolysis product with a water soluble salt of Ba, Sr, or Ca in an aqueous alkaline solution having a pH not less than 13 to thereby obtain said metal titanate fine powder, and

filtering said fine powder from the remaining solution.

4,520,005

METHOD OF MAKING A COMPOUND

Yung-Fang Y. Yao, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 548,070, Nov. 2, 1983, abandoned. This application Nov. 5, 1984, Ser. No. 668,544

Int. Cl.³ C01G *45/12*

U.S. Cl. 423—599 **2 Claims**

1. A method of making a compound selected from the group consisting of birnessite compounds of the formula $Bi_xMn_yO_{2y+1.5x}.zH_2O$, wherein the y/x ratio is in a range of from about 7 to about 18 and the z/y ratio is in a range of from about 0.5 to about 0.6, $Pb_xMn_yO_{2y+x}.zH_2O$, wherein the y/x ratio is in a range of from about 6 to about 10 and the z/y ratio is in a range of from about 0.5 to about 0.6, and manganese oxide compounds containing both of these compounds, characterized by the steps of:

forming a solution by mixing $Mn(NO_3)_2$ with a nitrate of bismith or lead or mixtures thereof;

maintaining said solution at a relatively constant temperature;

adding NaOH to said solution, whereby $Mn(OH)_2$ and a hydroxide of bismuth or lead or mixtures thereof form a suspension;

agitating said suspension;

passing oxygen through said suspension while said suspension is being agitated, whereby said $Mn(OH)_2$ and said hydroxide of bismuth or lead or mixtures thereof can react to form a compound selected from the group consisting of birnessite compounds of the formula $Bi_xMn_yO_{2y+1.5x-z}$

H_2O, wherein the y/x ratio is in a range of from about 7 to about 18 and the z/y ratio is in a range of from about 0.5 to about 0.6, $Pb_xMn_yO_{2y+x}.zH_2O$, wherein the y/x ratio is in a range of from about 6 to about 10 and the z/y ratio is in a range of from about 0.5 to about 0.6, and manganese oxide compounds containing both of these compounds;

filtering said suspension to recover said birnessite compound;

washing said recovered birnessite compound with water; and

drying said washed birnessite compound.

4,520,006

PROCESS FOR THE PURIFICATION OF SULFURIC ACID BY-PRODUCT FROM BORON TRIFLUORIDE SYNTHESIS

Charles Laviron, 27 A, rue Soeur Souvier, 69005 Lyons; Henri Lecouls, 7, avenue Beauregard, 69230 Saint Genis Laval, and Louis Mésaros, Avenue d'Auvergne, La Querencia, 13310 Saint Martin de Crau, all of France

Filed Nov. 17, 1983, Ser. No. 552,480

Claims priority, application France, Dec. 17, 1982, 82 21203

Int. Cl.³ C01B *17/90*

U.S. Cl. 423—531 **6 Claims**

1. A process for the purification of anhydrous by-product sulfuric acid which is contaminated with fluorine and boron from the synthesis of boron trifluoride, wherein the atomic ratio of fluorine to boron is three or more, which comprises diluting the anhydrous sulfuric acid with from one to ten percent water, based on the weight of sulfuric acid, and contacting the diluted acid with an inert entraining gas, the temperature of the process being greater than 90° C.

4,520,007

ANTI-COAGULANTS OF THE 4-HYDROXYCOUMARIN TYPE AND RODENTICIDAL COMPOSITIONS (BAITS) COMPRISING SUCH ANTI-COAGULANTS

Ian D. Entwistle, Sittingbourne, and Peter Boehm, Maidstone, both of England, assignors to Shell Oil Company, Houston, Tex.

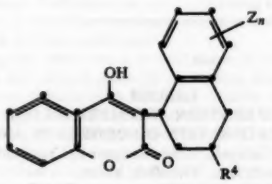
Filed Jun. 14, 1983, Ser. No. 504,348

Claims priority, application United Kingdom, Jun. 14, 1982, 8217219; Jan. 10, 1983, 8300549

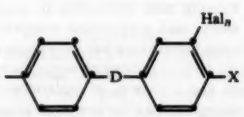
Int. Cl.³ A01N *43/16, 25/08, 25/00;* **C07D** *311/56*

U.S. Cl. 424—17 **13 Claims**

1. A compound of the formula II

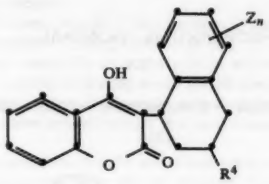


in which Z represents a chlorine atom, n is 0, 1 or 2 and R^4 represents

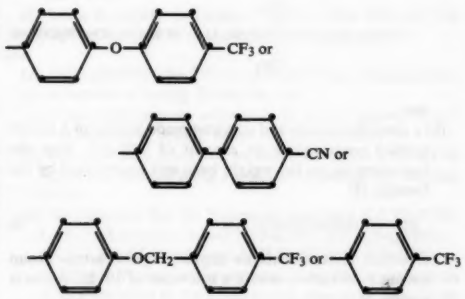


in which Hal is a fluorine or chlorine atom and n is 0 or 1, X is a fluorine, chlorine or bromine atom or a CN, CF_3 or OCF_3 group and D represents $—OCH_2—$ or $—(CH_2)_m—$, where m is 2 to 3.

7. A compound of the molecular formula II



in which Z represents a chlorine atom, n is 0, 1 or 2 and R^4 represents



the compound being in cis or trans or mixed cis/trans form.

12. A rodenticidal composition comprising a carrier in combination with, as active ingredient, a rodenticidally effective amount of a compound according to claims **1**, **7**, **8** or **10**.

13. A method of exterminating rodents at a locus, or preventing or reducing loss or deterioration by rodent attack at said locus, by providing at said locus bait comprising a rodenticidal composition, as claimed in claim **12**.

4,520,008

HAIR SETTING LOTION

Hiroshi Ando, Funabashi, and Takeo Okumura, Sakura, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 363,884

Claims priority, application Japan, Apr. 7, 1981, 56-51977

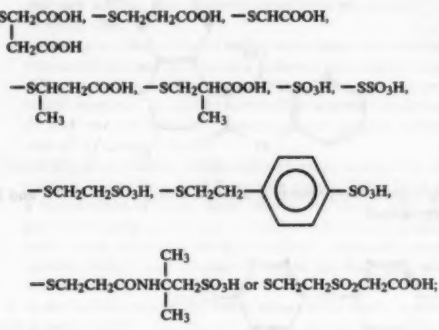
Int. Cl.³ A61K *7/11, 9/12*

U.S. Cl. 424—47 **8 Claims**

1. A hair setting lotion comprising the following ingredients (a) and (b):

(a) 0.2–10.0 wt% of a hair setting polymer compound selected from the group consisting of polyvinylpyrrolidone, copolymers of vinyl pyrrolidone and vinyl acetate, terpolymers of vinyl pyrrolidone, vinyl acetate and alkylaminoacrylates, lower alkyl esters of copolymers of methylvinyl ether and maleic anhydride, copolymers of vinyl acetate and crotonic acid copolymers of acrylic acid, arylic acid alkyl esters, acrylic acid alkyl esters, methacrylic alkylesters and acrylic acid, methacrylic acid, acrylic acid alkyl esters and acrylic acids methacrylic acid alkyl esters, methacrylic acid and acrylic acid alkyl esters, methacrylic acid and methacrylic acid alkyl esters and methacrylic acid, acrylic acid alkyl esters and methacrylic acid alkyl esters, copolymers of acrylic acid, acrylic acid alkyl esters and N-alkylacrylamides, amphoteric acrylic polymer compounds obtained by copolymerizing dialkylaminoethyl methacrylates, dialkylaminoethyl acrylates and diacetoneacrylamide and acrylic acid, methacrylic acid, acrylic acid alkyl esters and methacrylic acid alkyl esters and reacting the copolymers with acetic halides, and decomposition derivatives of keratin materials

wherein the thiol groups of the decomposition derivative are at least one of



and

(b) a propylene oxide and ethylene oxide adduct of a higher alcohol contained in an amount of 0.05–1.0 time the ingredient (a) on the weight basis and represented by the formula (I)

$$RO-(C_3H_6O)_n(C_2H_4O)_m-H \quad (I)$$

in which R represents an aliphatic hydrocarbon group having 8–20 carbon atoms, n is a value of 10–50, and m is a value of 3–20,

the balance comprising a solvent selected from the group consisting of water, a lower alcohol and mixtures thereof.

4,520,009

SUSTAINED RELEASED ASPIRIN FORMULATION

James M. Dunn, Englewood, Colo., assignor to Verex Laboratories, Inc., Englewood, Colo.

Filed Nov. 28, 1983, Ser. No. 555,700
Int. Cl.³ A61K *31/60, 31/74*
U.S. Cl. 424—78 **12 Claims**

1. A constant release aspirin tablet comprising from 85–95 weight percent of aspirin, from 1.5–5 weight percent of microcrystalline cellulose, from 1–10 weight percent of cellulose acetate phthalate, from 0.75–4 weight percent of a plasticizer, from 0.75–5 weight percent of a pharmaceutically acceptable diluent, and from 0.5 to 2 percent of a lubricant.

4,520,010

PROCESS FOR MODIFYING THE ELECTRICAL PROPERTIES OF SELENIUM, AND SELENIUM ALLOYS

Santokh S. Badesha, Ontario, and Martin A. Abkowitz, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Jun. 2, 1983, Ser. No. 500,504
Int. Cl.³ B05D *7/14*
U.S. Cl. 427—83 **8 Claims**

1. A process for improving the electron transporting properties of selenium, consisting essentially of (1) providing a source of selenium, (2) treating the selenium, with hydrazine contained in an organic solvent in an amount of from about 0.1 percent by volume to about 15 percent by volume, (3) heating the resulting mixture to a temperature of from about 50 degrees centigrade to about 120 degrees centigrade, wherein there results selenium having homogeneously and permanently absorbed thereon water free hydrazine.

4,520,011

INACTIVATING PROTEIN SYNTHESIS BY INCUBATING ANTI-THY 1.1-RICIN A CHAIN MONOCLONAL ANTIBODY HYBRIDS WITH TARGET PROTEIN CELLS

David M. Neville, Jr., Bethesda, and Richard J. Youle, Kensington, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 19, 1982, Ser. No. 350,222
Int. Cl.³ A61K *39/44, 39/395, 45/05*
U.S. Cl. 424—85 **2 Claims**

1. In a method of inactivating protein synthesis in mammalian cells containing Thy 1.1 antigen receptor sites by incubating anti-Thy 1.1-ricin A chain monoclonal antibody hybrids with target cells in solution, the improvement which consists of the step of separately adding ricin B chain to the mixture.

4,520,012

COMPOSITION OF MATTER FOR IMPROVING HAIR GROWTH

Marguerite Alfonsi, Batiment F-1-Allée des Glaieuls, 91130 Ris Orangis, France

Filed Feb. 3, 1982, Ser. No. 345,446
Claims priority, application France, Feb. 3, 1981, 81 02010
Int. Cl.³ A61K *35/12, 35/78*
U.S. Cl. 424—95 **12 Claims**

1. A complex for treating the scalp, comprising at least the second of the following two products:

(A) a lotion for preliminary use comprising substantially the same amount of non deodorized mineral oil and 70% ethyl alcohol, in which have soaked during about one month the following plants: rosemary, thyme, clove, sage, lavender and flowers and seeds of nasturtium and camomile;

(B) a cream comprising the following ingredients with a percentage given in weight:

Bergamot oil: 0.75 to 2
Vegetable alcohol: 1 to 4
Marrow: at least 90
Oil: 2 to 5
Flowers of sulphur: 1 to 3.

4,520,013

TOPICAL PREPARATION AND METHOD FOR USING SAME IN TREATING SKIN DISORDERS IN ANIMALS

Jerry W. Nezat, Kalispell, Mont., assignor to Creative Research and Development, Inc., Whitefish, Mont.

Filed Mar. 10, 1983, Ser. No. 474,165
Int. Cl.³ A61K *33/34*
U.S. Cl. 424—141 **31 Claims**

1. A topical preparation adapted for application to the skin of animals for treating mite infestation in animals including dogs, cats and sheep, said preparation comprising a solution having the following ingredients: between approximately three and approximately twelve gallons of water; between approximately 0.2 ounce and 5 ounces of malathion in an amount which is large enough to be effective in treating mite infestation but which is small enough so as to have little or no carcinogenic effect, and between approximately 0.5 ounce and approximately 10 ounces of copper sulfate in an amount which is large enough to be effective in treating mite infestation but which is small enough as not to cause burning of the skin.

4,520,014
TREATMENT OF DIARRHOEA

Peter M. Newsome, Worcester Park, and Noel A. Mullan, Cranleigh, both of England, assignors to Beecham Group p.l.c., England

Continuation-in-part of Ser. No. 177,365, Aug. 11, 1980, Pat. No. 4,332,814. This application Feb. 19, 1982, Ser. No. 350,403
Claims priority, application United Kingdom, Aug. 23, 1979, 7929434
The portion of the term of this patent subsequent to Mar. 30, 1999, has been disclaimed.
Int. Cl.[3] A61K *33/14, 31/415, 31/165*
U.S. Cl. 424—153 4 Claims

1. A composition adapted to be administered to livestock for the treatment or prevention of diarrhoea which composition comprises an oral rehydration formulation and an amount effective to treat diarrhoea of a compound which is an α-adrenergic agonist and which has vasoconstrictor activity and is selected from formula (I).

A—B—C (I)

wherein: A is an optionally substituted 2-imidazoline group or an optionally substituted guanidine group, said substituents, when present, being C_{1-4} alkyl, C_{1-4} alkoxy, halogen or hydroxy; B is a direct bond or —CH_2—, —CH_2O—, —$COCH_2$— or —NH—; and C is a C_{6-10} mono- or bi-cyclic group which is either an aromatic group, benzothienyl, or a group containing an aromatic moiety; and which group C may be substituted by C_{1-4} alkyl, C_{1-4} alkoxy, halogen or hydroxyl; or a salt thereof.

2. A composition according to claim 1 wherein said oral rehydration formulation comprises a pharmacologically acceptable aqueous solution containing at least 0.5% w/v of an actively absorbed monosaccharide, at least 25 mM sodium ions and having an osmolarity less than 500 m Osmolar.

4,520,015
METHOD FOR MANUFACTURING A PRODUCT FOR DESTROYING HARMFUL ANIMALS

Bernard Pesche, 4 Boulevard Diderot, 75012 Paris, France

Filed Jun. 9, 1983, Ser. No. 502,684
Claims priority, application France, Jun. 14, 1982, 82 10326
Int. Cl.[3] A01N *35/00, 43/16, 59/08;* B01J *13/00*
U.S. Cl. 424—153 14 Claims

1. A method for manufacturing a product which is useful for destroying harmful animals, and which has approximately the shape and consistency of a natural food for the animal, which comprises the successive steps of:

providing a fluid, aqueous paste containing nutritive constituents, at least one constituent which is toxic to the animal, and a gelable constituent;

shaping said paste into a desired shape of the final product;

gelling said shaped paste by contacting said paste with an aqueous solution of a metal salt capable of achieving ion exchange with said gelable constituent; and

preserving said gelled product in an acidic, aqueous, saline medium.

14. A method according to claim 1, wherein the preservation is effected in an aqueous brine containing 2 to 40% by weight of sodium chloride, 0.2 to 1% by weight of a gelling metal salt and a sufficient amount of a weak acid so that the brine has a pH of between 6.5 and 7.

4,520,016
BACTERIOLYTIC PROTEINS

Dan Hultmark, Nacka; Hakan Steiner, Vallenhuna; Torgny Rasmuson, Umeå , and Hans G. Boman, Stockholm, all of Sweden, assignors to KabiGen AB, Stockholm, Sweden

Division of Ser. No. 160,393, Jun. 17, 1980, Pat. No. 4,355,104.
This application Aug. 2, 1982, Ser. No. 404,119
Int. Cl.[3] A61K *37/02;* C12P *21/00, 21/02;* C07C *103/52*
U.S. Cl. 514—12 1 Claim

1. A process for inhibiting gram negative bacteria comprising contacting said bacteria with a bactericidally effective amount of a protein selected from the group consisting of P9A and P9B wherein:

(1) P9A comprises the following identifying characteristics:

(a) is capable of lysing *Escherichia coli;*

(b) loses essentially no activity in its action against *E. coli* after heating in boiling water for 30 minutes;

(c) separates from lysozyme by selective elution from a CM Sepharose column using a gradient of ammonium formate buffer;

(d) comprises the first 33 amino acid residues in the following sequence from the N terminal N-LYS-TRP-LYS-LEU-PHE-LYS-LYS-ILE- GLU-LYS-VAL-GLY-GLN-ASN-ILE-ARG-ASP-GLY-ILE-ILE-LYS-ALA-GLY-PRO-ALA-VAL-ALA-VAL-VAL-GLY-GLN-ALA-THR

(e) has a monomer molecular weight within 20% of 3564 daltons;

and

(2) P9B comprises the following identifying characteristics:

(a) is capable of lysing *Echerichia coli;*

(B) loses essentially no activity in its action against *E. coli* after heating in boiling water for 30 minutes;

(c) separates from lysozyme by selective elution from a CM Sepharose column using a gradient of ammonium formate buffer;

(d) the monomer has the N terminal sequence N-LYS-TRP-LYS-VAL-(MET)-ILE-(PHE)-LYS-LYS-ILE-(PHE)-GLU-LYS-GLY-ARG-ASN-ILE-(PHE)-ARG-ASN-(LYS)-GLY wherein the amino acid residue in parenthesis is an alternative to the immediately preceding amino acid residue;

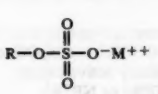
(e) has a dimer molecular weight within 20% of 7000 daltons.

4,520,017
METHOD OF REDUCING NUTRIENT ABSORPTION

Deger C. Tunc, Springfield Rd., East Brunswick, N.J. 08816

Filed Feb. 4, 1983, Ser. No. 464,024
Int. Cl.[3] A61K *31/715;* C08B *37/00, 37/08*
U.S. Cl. 514—54 8 Claims

1. A method of reducing the rate of nutrient absorption in the small intestine of a mammal by administering to said mammal an effective amount of a composition comprising: an anionic sulfated polysaccharide having the formula



wherein

R=kappa carrageenan: 3,6-anhydro-D-galactose (linked through C-4 to D-galactose);

lambde carrageenan: alpha-D-galactose units (1 3) linked;

iota carrageenan: D-galactose 3,6-anhydro-D-galactose;

agar-agar: D-galactose 3,6-anhydro-L-galactose;

furcellaran: D-galactose 3,6-anhydro-D-galactose;

laminaran sulfate: D-glucopyranose units linked through 1 and 3 positions by -linkages;

galactan sulfate: galactan;

chondroitin sulfate: galactosamino-glucuronan; and

M^{++}=Ca^{++}, Mg^{++}, Zn^{++}, Ba^{++} in a pharmaceutically acceptable carrier.

4,520,018

5-SUBSTITUTED-4-OXO-PGI$_1$ DERIVATIVES, PGI$_1$ COMPOUNDS OF SIMILAR STRUCTURE, THEIR PHARMACEUTICAL METHODS AND PROCESS FOR THE PREPARATION OF SAID COMPOUNDS

Vilmos Simonidesz; József Ivanics; Géza Galambos; Ágnes Papp neé Behr; Gábor Kovacs; Judit Skopál, and Ildikó Szilágyi, all of Budapest, Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt., Budapest, Hungary

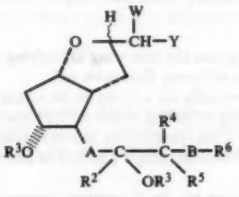
Filed Apr. 19, 1982, Ser. No. 369,543

Claims priority, application Hungary, Apr. 14, 1981, 965

Int. Cl.^{3} A61K *31/557, 31/335;* C07D *307/935*

U.S. Cl. 514—469 56 Claims

1. A process for the preparation of a racemic or optically active compound of the formula I



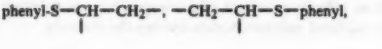
or a pharmaceutically acceptable salt thereof, wherein W is —COOR^1, —CN, —NO$_2$, C$_1$–C$_4$ alkanoyl, C$_1$–C$_4$ alkyl-sulfenyl, phenylsulfenyl, phenylsulfenyl where the phenyl is substituted by halogen, phenyl, C$_1$ to C$_4$ alkyl, or halo-C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkyl-sulfonyl, phenyl-sulfonyl, phenyl-sulfonyl where the phenyl is substituted by halogen, phenyl, C$_1$ to C$_4$ alkyl, or halo—C$_1$–C$_4$ alkyl, or W is phenyl-selenyl;

R^1 is hydrogen, C$_1$–C$_6$ straight or branched chain alkyl, C$_3$–C$_{10}$ cycloalkyl, phenyl—C$_1$–C$_4$ alkyl, or phenyl; Y is —COOR^1, —COR^1, —CN, or

or when W is nitro, Y is also hydrogen;

Z is oxygen or when W is nitro Z represents two hydrogens;

X is —CH$_2$—CH$_2$—, —CH=CH—, —CH$_2$—C—(CH$_3$)$_2$—, —(CH$_3$)$_2$—C—CH$_2$—,



or cyclopropylene;

Q is —COOM, —COOR^1, —CH$_2$OH, or COL^1, wherein M is pharmacologically active cation;

L^1 is —NH$_2$, —NHR^1 or NR^{1}R^1;

A is trans—CH=CH—, —C≡C—, or —CH$_2$—CH$_2$—;

R^2 is hydrogen having a steric position of α or β or is methyl or ethyl;

R^4 and R^5 are independently hydrogen or C$_1$–C$_4$ alkyl;

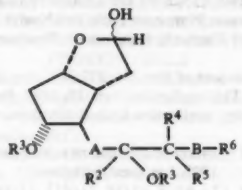
R^3 is hydrogen or a protecting group which is C$_1$–C$_4$ alkanoyl, benzoyl, benzoyl substituted by halogen, phenyl, C$_1$–C$_4$ alkyl, or halo—C$_1$–C$_4$ alkyl, or is tri—C$_1$–C$_4$ alkyl-silyl;

R^6 is C$_1$ to C$_6$ straight or branched chain alkyl, phenyl or phenyl substituted by halogen, phenyl, C$_1$ to C$_4$ alkyl or halo—C$_1$ to C$_4$ alkyl; and

B is methylene, oxygen or —NH—;

which comprises the step of:

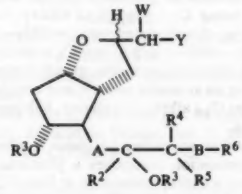
reacting a compound of the formula II



with a compound of the formula III

having an active methylene group, in the presence of a catalyst to obtain the desired product.

9. A compound of the formula I



or a pharmaceutically acceptable salt thereof, wherein W is —NO$_2$, C$_1$–C$_4$ alkyl-sulfenyl, phenyl-sulfenyl, phenyl-sulfenyl where the phenyl is substituted by halogen, phenyl, C$_1$–C$_4$alkyl, or halo—C$_1$–C$_4$ alkyl, C$_1$–C$_4$ alkyl-sulfonyl, phenyl-sulfonyl, phenyl-sulfonyl where the phenyl is substituted by halogen, phenyl, C$_1$–C$_4$ alkyl, or halo—C$_1$–C$_4$ alkyl, or W is phenyl-selenyl;

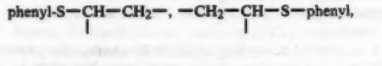
R^1 is hydrogen, C$_1$–C$_6$ straight or branched chain alkyl, C$_3$–C$_{10}$ cycloalkyl, phenyl—C$_1$–C$_4$ alkyl or phenyl;

Y is —COOR^1, —COR^1, —CN, or

or when W is nitro, Y is also hydrogen;

Z is oxygen or when W is nitro Z represents two hydrogens;

X is —CH$_2$—CH$_2$, —CH=CH—, —CH$_2$—C—(CH$_3$)$_2$—, —(CH$_3$)$_2$—C—CH$_2$—,



—or cyclopropylene;

Q is —COOM, —COOR^1, —CH$_2$OH, or —COL^1, wherein M is a pharmacologically active cation;

L^1 is —NH$_2$, —NHR^1 or —NR^{1}R^1;

A is trans—CH=CH—, —C≡C—, or —CH$_2$—CH$_2$—;

R^2 is hydrogen having a steric position of α or β or is methyl or ethyl;

R^4 and R^5 are independently hydrogen or C$_1$–C$_4$ alkyl;

R^3 is hydrogen or a protecting group which is C$_1$–C$_4$ alkanoyl, benzoyl, benzoyl substituted by halogen, phenyl, C$_1$–C$_4$ alkyl, or halo—C$_1$–C$_4$ alkyl, or is tri—C$_1$–C$_4$ alkyl-silyl;

R^6 is C$_1$–C$_6$ straight or branched chain alkyl, phenyl or phenyl substituted by halogen, phenyl, C$_1$–C$_4$ alkyl or halo—C$_1$–C$_4$alkyl; and

B is methylene, oxygen, or —NH—.

4,520,019

STABLE COMPOSITION AND PREPARATION THEREOF

Edgar E. Ribi; John L. Cantrell, both of Hamilton, and Steven M. Schwartzman, Stevensville, all of Mont., assignors to Ribi ImmunoChem Research, Inc., Hamilton, Mont.

Continuation of Ser. No. 372,844, Apr. 29, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,230

Int. Cl.³ A61K *35/78, 39/02*

U.S. Cl. 424—195.1 **7 Claims**

1. A method for producing a stable composition containing cell wall skeleton (CWS) and trehalose dimycolate (TDM) comprising:

(a) mixing CWS and TDM useful for treating tumors selected from the group consisting of bovine fibrosarcoma, equine sarcoid, equine melanoma, canine melanoma and bovine ocular sarcoma in a weight ratio of CWS to TDM of between about 1.0:1 and 6:1;

(b) adding a light hydrocarbon non-biodegradable oil to the resulting mixture; wherein said light hydrocarbon non-biodegradable oil has a viscosity of between about 8 and 12 centistokes measured at 100° F. and is present in an amount between about 0.5 and 3.0 percent by volume based on the total volume of the composition;

(c) homogenizing the resulting oil containing mixture;

(d) adding a detergent in an amount of between about 0.02 and 0.20 percent by volume based on the total volume of the composition selected from the group consisting of polyoxyethylene sorbition mono oleates and non-ionic emulsifiers of fatty acid polyols and polyanhydrides to said homogenized oil containing mixture;

(e) homogenizing the resulting mixture to form an emulsion containing oil droplets coated with CWS and TDM;

(f) lyophilizing the resulting emulsion and subsequently reconstituting said emulsion with sterile distilled water.

4,520,020

METHOD OF PREVENTING VIRUS INCREASE IN PLANTS

Gad Loebenstein, Rehovot, and Abed Gera, Ramat Aviv, both of Israel, assignors to State of Israel, Ministry of Agriculture, Beit Dagan, Israel

Filed Jul. 15, 1982, Ser. No. 398,358

Claims priority, application Israel, May 13, 1982, 65765

Int. Cl.³ A61K *35/78;* **C12P** *21/06*

U.S. Cl. 424—197.1 **22 Claims**

1. A method of isolating a material which inhibits replication of TMV, CMV and PVX comprising the steps of:

isolating protoplasts of a plant of the genus *Nicotiana tabacum* L. having an N gene;

inoculating the protoplasts with Tobacco Mosaic Virus;

incubating the inoculated protoplasts under continuous illumination for between 24 and 96 hours;

removing the protoplasts from the incubation medium; and

sterilizing the incubation medium.

13. A method of immunizing a plant susceptible to TMV, CMV and PVX against the replication of any of said viruses comprising the step of introducing material isolated according to the method of either claim 1 or claim 5 into the plant.

4,520,021

SUBSTITUTED CAPROLACTAM DERIVATIVES AS ANTIHYPERTENSIVES

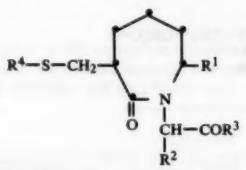
Elbert E. Harris, Westfield, and Eugene D. Thorsett, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 394,972, Jul. 2, 1982, Pat. No. 4,409,146, which is a continuation-in-part of Ser. No. 294,863, Aug. 25, 1981, abandoned, which is a continuation-in-part of Ser. No. 194,692, Oct. 6, 1980, abandoned. This application Jun. 16, 1983, Ser. No. 505,147

Int. Cl.³ A61K *31/33*

U.S. Cl. 514—212 **6 Claims**

1. A method of treating hypertension which comprises administering to a patient in need of said treatment an antihypertensively effective amount of a compound of the formula:



wherein

R^1 is hydrogen, loweralkyl, unsubstituted cycloalkyl having 3 to 10 carbon atoms, amino loweralkyl, alkylamino loweralkyl, hydroxyalkyl, dialkylamino loweralkyl, arloweralkyl, aryl, substituted aryl wherein the substituent is halo, alkyl, aminoalkyl, or alkoxy;

R^2 is hydrogen or loweralkyl;

R^3 is hydroxyl, loweralkoxy, or aralkyloxy;

R^4 is hydrogen or loweralkanoyl; or the pharmaceutically acceptable salts thereof wherein in said R^1, R^2, R^3 and R^4 groups; said alkyl groups have 1 to 12 carbon atoms; said loweralkyl groups have 1 to 8 carbon atoms; said aryl and said ar prefix denote unsubstituted aromatic ring(s) having 6 to 12 carbon atoms.

4,520,022

SUBSTITUTED VINYL CEPHALOSPORINS

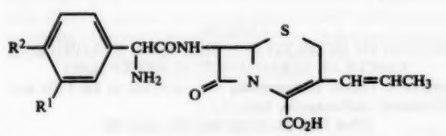
Hideaki Hoshi, Ichikawa; Jun Okumura, Yokohama; Takayuki Naito, Kawasaki; Yoshio Abe, and Shimpei Aburaki, both of Tokyo, all of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 461,833, Jan. 28, 1983, abandoned. This application Dec. 28, 1983, Ser. No. 564,604

Int. Cl.³ C07D *501/22;* **A61K** *31/545*

U.S. Cl. 514—200 **7 Claims**

1. 7α-(D)-Phenylglycylamido-3-propenyl cephalosporin derivatives having the formula



wherein the 3-propenyl group has the Z-configuration, R^1 is hydrogen, chlorine, or methoxy, and R^2 is hydrogen, or hydroxy with the proviso that when R^2 is hydrogen R^1 is also hydrogen, and the pharmaceutically acceptable acid addition and metal salts thereof, said salts being antibacterially effective on oral or parenteral administration.

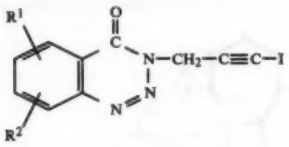
4,520,023

3-(3-IODOPROPARGYL)-BENZO-1,2,3-TRIAZIN-4-ONES, AND THEIR USE IN MICROBICIDAL AGENTS

Hans-Georg Schmitt, Leverkusen; Wilfried Palus, and Hermann Genth, both of Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 4, 1983, Ser. No. 549,338
Claims priority, application Fed. Rep. of Germany, Nov. 9, 1982, 3241265
Int. Cl.³ C07D *253/08;* A61K *31/53*
U.S. Cl. 514—241 16 Claims

1. 3-(3-iodopropargyl)-benzo-1,2,3-triazin-4-one of the formula

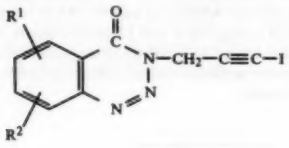


in which

R^1 is hydrogen, lower alkyl, halogen, cyano, nitro, lower alkoxy, aryloxy having 6–18 carbon atoms, lower alkylthio, arylthio having 6–18 carbon atoms, C_1–C_{10}-alkoxycarbonyl, lower alkylsulphonyl or arylsulphonyl having 6–18 carbon atoms, and

R^2 is hydrogen, lower alkyl or halogen.

14. A microbicidal composition comprising a microbicidally effective amount of 3-(3-iodopropargyl)-benzo-1,2,3-triazin-4-one of the formula



in which

R^1 is hydrogen, lower alkyl, halogen, cyano, nitro, lower alkoxy, aryloxy having 6–18 carbon atoms, lower alkylthio, arylthio having 6–18 carbon atoms, C_1–C_{10}-alkoxycarbonyl, lower alkylsulphonyl or arylsulphonyl having 6–18 carbon atoms, and

R^2 is hydrogen, lower alkyl or halogen and a microbiologically compatible diluent.

4,520,024

METHOD OF SELECTIVELY BLOCKING PERIPHERAL VASCULAR SEROTONERGIC RECEPTORS

Marlene L. Cohen, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Feb. 11, 1983, Ser. No. 465,745
Int. Cl.³ A61K *31/495*
U.S. Cl. 514—255 1 Claim

1. A process for blocking peripheral vascular serotonergic receptors in living mammals in need of such treatment without blocking alpha$_1$ receptors which comprises administration by the oral or parenteral route to said mammals of a serotonergic receptor blocking amount of 1-(1-naphthyl)piperazine.

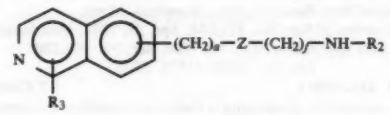
4,520,025

BICYCLIC NITROGEN HETEROCYCLIC ETHERS AND THIOETHERS, AND THEIR PHARMACEUTICAL USES

Henry F. Campbell, Lansdale; Donald E. Kuhla, Doylestown; William L. Studt, Harleysville, and Stuart A. Dodson, Lansdale, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

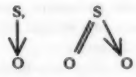
Filed Jul. 21, 1982, Ser. No. 400,350
Int. Cl.³ C07D *217/24;* A61K *31/47*
U.S. Cl. 514—275 17 Claims

1. A compound of the formula



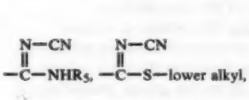
wherein:

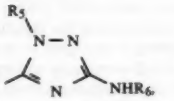
Z is O, S,

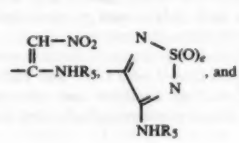


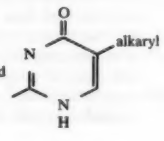
or CH_2;

R_2 is selected from the group consisting of









R_3 is hydrogen, lower alkyl, halo, lower alkoxy, hydroxy, hydroxy lower alkyl, halo lower alkyl, amino lower alkyl, mono- or di-loweralkylamino loweralkyl, amino, lower alkylamino, or diloweralkylamino;

R_5 is H or lower alkyl;

R_6 is H, lower alkyl or lower alkanoyl;

and wherein:

a is 0 or 1;

e is 1 or 2;

f is 1, 2, 3 or 4;

or a pharmaceutically acceptable salt thereof.

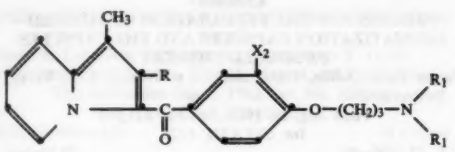
4,520,026

INDOLIZINE DERIVATIVES AND USE AS CARDIOVASCULAR AGENTS

Gilbert Rosseels, and Henri Inion, both of Wemmel, Belgium, assignors to S. A. Labaz N.V., Belgium

Continuation-in-part of Ser. No. 232,138, Feb. 6, 1981, Pat. No. 4,378,362, which is a continuation-in-part of Ser. No. 207,270, Nov. 17, 1980, abandoned. This application Jun. 29, 1982, Ser. No. 393,411
Int. Cl.³ A61K *31/44;* C07D *221/02*
U.S. Cl. 514—299 26 Claims

1. An indolizine derivative corresponding to the formula:



and pharmaceutically acceptable acid addition salts thereof wherein R represents n-butyl or phenyl, X_2 represents hydrogen, chlorine or bromine and R_1 represents n-propyl or n-butyl.

4,520,027
ANTI-INFLAMMATORY ESTERS OF 4-(1-HYDROXY-2-[(ACYLAMINO)ALKYLAMINO]ETHYL) PHENOLS

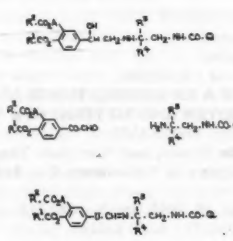
Peter R. Marsham, Poynton, and David S. Thomson, Holmes Chapel, both of United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

Filed Dec. 23, 1982, Ser. No. 452,804

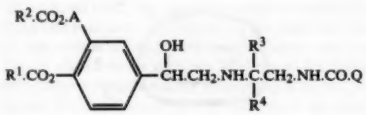
Claims priority, application United Kingdom, Dec. 23, 1981, 8138830

Int. Cl.³ C07D *213/56;* A61K *31/42*

U.S. Cl. 514—354 **8 Claims**



1. A diester of the formula:



[I]

wherein R^1 and R^2 are independently (3-5C)alkyl; and (i) A is a direct bond, R^3 and R^4 are hydrogen, and Q is 3-pyridyl, 4-pyridyl or 2-pyridylmethyl; or (ii) A is a direct bond, R^3 and R^4 are methyl, and Q is 3-pyridyl or 2-pyridylmethyl; or a pharmaceutically acceptable acid-addition salt thereof.

7. A method for the production of an anti-inflammatory effect in an area of skin of a warm-blooded animal requiring such treatment which comprises topical administration to said area of an effective amount of an ester of formula I or a pharmaceutically acceptable acid-addition salt thereof as claimed in claim 1.

4,520,028
α-AMINOBUTYRIC ACID TRANSAMINASE INHIBITORS

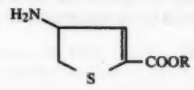
Jerry L. Adams, West Chester; Brian W. Metcalf, Mason, and Bruce J. Lippert, Cincinnati, all of Ohio, assignors to Merrell Dow Pharmaceuticals Inc., Cincinnati, Ohio

Continuation of Ser. No. 597,786, Apr. 6, 1984, abandoned, which is a continuation of Ser. No. 540,744, Oct. 11, 1983, abandoned. This application Sep. 5, 1984, Ser. No. 647,867

Int. Cl.³ A61K *31/38;* C07D *333/00*

U.S. Cl. 514—447 **9 Claims**

1. A compound of the formula



inclusive of the individual enantiomers and racemic mixtures thereof, the pharmaceutically acceptable salts thereof, wherein R is hydrogen and C_{1-6} lower alkyl.

4,520,029
FARNESENE DERIVATIVES, MUCOSAL STABILIZING COMPOSITIONS AND METHOD OF MANUFACTURING THE SAME

Tsuyoshi Tomiyama, Sakaki, Japan, assignor to Kotobuki Seiyaku Co., Ltd., Nagono, Japan

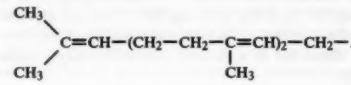
Continuation of Ser. No. 315,464, Oct. 27, 1981, abandoned. This application Jun. 27, 1983, Ser. No. 508,142

Claims priority, application Japan, Dec. 20, 1980, 55-180833

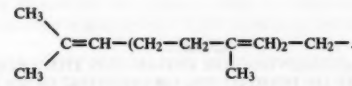
Int. Cl.³ C07C *125/065, 103/133;* A61K *31/27, 31/23*

U.S. Cl. 514—479 **10 Claims**

1. The compound N-farnesyl farnesylcarboxamide of the formula: R—CONH—R, wherein R represents the group



2. The compound N-farnesyl farnesylcarbamate of the formula: R—NHCOO—R, wherein R represents the group



5. A method of treating peptic ulcer which comprises administering to a patient having peptic ulcer a therapeutic amount of N-farnesyl farnesylcarboxamide.

6. A method of treating peptic ulcer which comprises administering to a patient having peptic ulcer a therapeutic amount of N-farnesyl farnesylcarbamate.

7. A method of treating inflammation which comprises administering to a patient having inflammation a therapeutically effective amount of a compound selected from the group consisting of farnesyl farnesylcarboxylate, N-farnesyl farnesylcarboxamide and N-farnesyl farnesylcarbamate.

4,520,030
ANTI-ULCER AGENTS

Icilio Cavero, Creteil, and Salomon Langer, Paris, both of France, assignors to Synthelabo, Paris, France

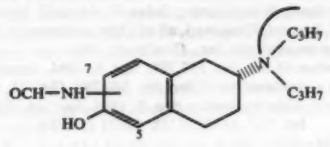
Filed Dec. 12, 1983, Ser. No. 560,250

Int. Cl.³ A61K *31/165*

U.S. Cl. 514—629 **4 Claims**

1. A method of treating gastric or duodenal ulcer or gastric hypersecretion in a patient, which comprises orally or paren-

terally administering to said patient a compound of the formula



wherein the formylamino group is in the 5— or —7—position, or a pharmaceutically acceptable salt thereof, in an amount effective to treat gastric or duodenal ulcer or gastric hypersecretion.

4,520,031

METHOD FOR REDUCING TOXIC EFFECTS OF METHYL-GLYOXAL BIS-GUANYLHYDRAZONE

William A. Knight, III, San Antonio, Tex., assignor to The United States of America as represented by the Secretary of Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 268,670, Jun. 1, 1981, abandoned, which is a continuation of Ser. No. 128,200, Mar. 7, 1980, abandoned. This application Aug. 24, 1982, Ser. No. 410,965

Int. Cl.³ A61K *31/155*

U.S. Cl. 514—632 **3 Claims**

1. A method for reducing the toxic effects of methyl-glyoxal bis-guanylhydrazone in a patient comprising:

administering to said patient at approximately weekly intervals a therapeutically effective dose ranging from about 250 mg/m^2 to about 1000 mg/m^2 of methyl-glyoxal bis-guanylhydrazone in its pharmaceutically acceptable salt form, dispersed in a suitable physiologically compatible vehicle.

4,520,032

USE IN AUGMENTING OR ENHANCING THE AROMA OR TASTE OF FOODSTUFFS OR CHEWING GUMS OF TETRAHYDRO-1,1,2,3,3-PENTAMETHYL-3A[4H]-INDANOL

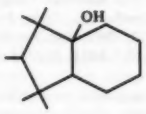
John B. Hall, Rumson, and Takao Yoshida, West Long Branch, both of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 14, 1984, Ser. No. 589,662

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—3 **1 Claim**

1. A process for augmenting or enhancing the walnut aroma or taste of a walnut-flavored foodstuff or chewing gum comprising the step of adding to said foodstuff or chewing gum from about 0.05 ppm up to about 150 ppm based on the total food composition or chewing gum composition of the compound having the structure:



4,520,033

PROCESS FOR THE PREPARATION OF FOAMED AROMATIZATION CAPSULES AND THE CAPSULES PRODUCED THEREBY

James Tuot, Dublin, Ohio, assignor to Nestec, S.A., Vevey, Switzerland

Filed Aug. 10, 1983, Ser. No. 521,909

Int. Cl.³ A23L *1/22*

U.S. Cl. 426—96 **23 Claims**

1. A process for producing foamed aromatization capsules capable of floating at the surface of an aqueous medium comprising the steps of:

(a) mixing an aqueous essence containing aromatic constituents with a water-soluble powdered edible solid to form a core mixture;

(b) foaming the core mixture by the injection of gas into said mixture to provide a foam;

(c) adding the foamed mixture in the form of droplets to a wall material of water-soluble powdered edible solids while the said wall material is being agitated to cause a water flux from the foam droplets to the surrounding wall material and form coated particles, each such coated particle having a continuous layer of said wall material surrounding a foam droplet;

(d) curing the coated particles by continuing agitation of the wall material until the surrounding layer of wall material about the coated particles forms a continuous, hardened shell surrounding a honeycombed structure core containing the aromatic constituents; and then

(e) collecting the resulting capsules.

18. Aromatization capsules capable of floating at the surface of an aqueous medium comprising a hardened continuous shell of a water-soluble edible food material surrounding a core having a honeycombed hardened foam structure containing aromatic constituents.

4,520,034

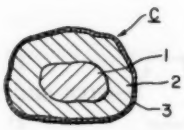
PASTY MASS OF A PROCESSED TUBER AND AN EDIBLE OUTER COVER AND METHOD FOR MAKING THE SAME

Mikio Ishii; Kazunobu Iiyama, and Tomoyoshi Yazaki, all of Tokyo, Japan, assignors to Nakamuraya Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,212

Int. Cl.³ A23L *1/216*

U.S. Cl. 426—96 **20 Claims**



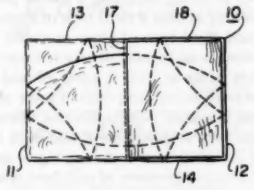
1. A food product which comprises a pasty mass of a processed tuber of a desired form, and a continuous, tenacious, thin edible film consisting essentially of a milk protein-containing material covering the entirety of the pasty mass.

6. A method for making a food product which comprises the steps of applying an edible film-forming material consisting essentially of milk protein-containing material onto a pasty mass of a desired form made of a processed tuber, and drying or heating the applied material to thereby completely cover the pasty mass with a continuous, tenacious film of said edible film-forming material.

4,520,035
PIZZA DOUGH PACKAGE AND METHOD OF MAKING SAME

Mark A. Lamonica, 1533 85th St., Brooklyn, N.Y. 11228

Continuation of Ser. No. 379,469, May 18, 1982, abandoned.
This application Sep. 2, 1983, Ser. No. 528,864
Int. Cl.³ A21D 10/02
U.S. Cl. 426—128 11 Claims



1. A folded pizza dough package comprising:

an initially disk-shaped layer of uncooked pizza dough,

means including a first sheet of precut release material placed substantially centrally on said disk-shaped layer and having two spaced substantially straight peripheral edges defining first and second substantially parallel chord lines relative to the respective adjacent curved edge of said disk-shaped layer for folding said disk-shaped layer inwardly therealong, the corresponding chord heights of each chord lines being less than half the radius of said layer, said first sheet of precut release material defining a substantially arc shape at the peripheral portions thereof between said first and second chord lines and said arc-shaped peripheral portions extending substantially to the periphery of said initially disk-shaped layer of uncooked pizza dough between said first and second chord lines of said sheet of release material;

said disk-shaped layer being inwardly folded along and around said first and second chord lines of said first sheet of release material such that the juxtaposed portions of said disk-shaped layer produced by said inwardly folding of said disk-shaped layer along said first and second chord lines are separated by said first sheet of release material;

said inwardly folded portions of said disk-shaped layer not overlapping each other; and

a second precut sheet of release material extending between said two spaced edges of said first sheet of release material which define said first and second chord lines, said second sheet of release material having two spaced substantially straight peripheral edges which are substantially perpendicular to said first and second chord lines and which define third and fourth substantially parallel chord lines relative to the respective adjacent curved edge of said disk-shaped layer, the corresponding chord heights of said third and fourth chord lines being between 50% and 100% of the radius of said disk-shaped layer, said third and fourth chord lines defining fold lines for folding said disk-shaped layer inwardly therealong after said first-mentioned folding thereof, said second sheet of release material being placed on said pizza dough after folding of said disk-shaped layer inwardly along said first and second chord lines of said first sheet of release material, and said pizza dough being then folded inwardly along and around said third and fourth chord lines and over said second sheet of release material;

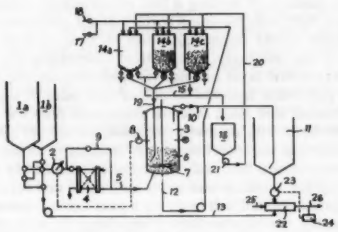
a third precut sheet of release material being placed over the portion of the pizza dough folded over one of the third and fourth chord lines before folding of the pizza dough over the other of said third and fourth chord lines so that layers of pizza dough do not directly contact each other;

whereby the resultant folded pizza dough has a substantially rectangular compact shape and is readily unfoldable and separable from said release sheets to assume said initial disk-shape.

4,520,036
PROCESS FOR TREATING MILK WITH A CATION-EXCHANGE RESIN FOR THE PREPARATION OF DECATIONIZED, ACIDIFIED MILK

Jean P. Rialland, Retiers, and Jean P. Barbier, Noyal sur Seiche, both of France, assignors to Laiteries E. Bridel, Retiers, France

Filed Jun. 29, 1983, Ser. No. 509,035
Claims priority, application France, Jul. 9, 1982, 82 12126
The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.
Int. Cl.³ A23C 9/146
U.S. Cl. 426—271 15 Claims



1. Process for the preparation of decationised, acidified milk having a pH less than or equal to 3.8, having the same content of proteinaceous materials and lactose as ordinary milk, a very low content of mineral elements, less than 4 g/l, and a Ca/P ratio less than 0.5, the process comprising contacting ordinary milk with a cation-exchange resin in the acid form, at a temperature above 4° C., and in the presence of an excess of milk previously acidified to a pH equal to or less than 3.8, in which the rate of introduction of the ordinary milk is such that the mixture of acidified and ordinary milks in contact with the exchange resin is maintained at a pH equal to or less than 3.8.

4,520,037
EDIBLE EMULSION HAVING AN IMPROVED MICROBIOLOGICAL STABILITY

Grahame Gould, Bedford; Anthony Crossley, Letchworth, and David P. J. Moran, Covington, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 7, 1983, Ser. No. 511,406
Claims priority, application United Kingdom, Jul. 8, 1982, 8219846
Int. Cl.³ A23D 3/04, 5/04
U.S. Cl. 426—330.6 24 Claims

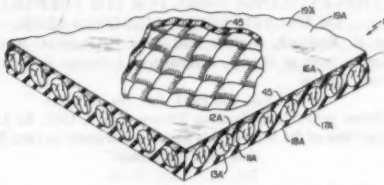
1. An edible emulsion comprising at least two differently formulated aqueous phases containing microbiologically labile nutrients and ingredients inhibiting bacterial growth, said aqueous phases being present in the form of discrete, differently formulated drops dispersed in a continuous plastic fat phase, wherein an effective amount of each ingredient inhibiting bacterial growth is concentrated along with a nutrient in at least part of the total aqueous phase and none of the nutrients is present unprotected.

4,520,038

POLYMERIC-COATED FABRIC LAYER, AND METHOD FOR MAKING THE SAME

Delmar D. Long, Rock Hill, S.C., and John F. Anderson, Jr., Springfield, Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Apr. 5, 1983, Ser. No. 482,365
Int. Cl.³ B05D *1/04*
U.S. Cl. 427—26 **5 Claims**



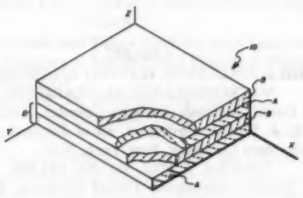
1. In a method of making a belt construction comprising a polymeric belt body having a surface and a polymeric-coated fabric layer means having an outer surface secured to said surface of said belt body, said method comprising the steps of providing a fabric layer having opposed sides, securing a main layer of polymeric material to one of said sides of said fabric layer, forming said main layer of polymeric material to have said outer surface facing away from said one side of said fabric layer, disposing said outer surface of said layer means against said surface of said belt body to provide an assembly thereof, and, thereafter, bonding said outer surface of said layer means to said surface of said belt body by a heat curing operation on said assembly, the improvement comprising the steps of securing a gauge building layer of fibers to said one side of said fabric layer with another layer of polymeric material that is disposed on said one side before said layer of fibers is disposed thereon whereby said gauge building layer of fibers has a plurality of voids therein, and then filling said voids of said gauge building layer of fibers with said polymeric material of said main layer in a liquid form thereof to form said main layer.

4,520,039

COMPOSITIONALLY VARIED MATERIALS AND METHOD FOR SYNTHESIZING THE MATERIALS

Stanford R. Ovshinsky, Oakland County, Mich., assignor to Sovonics Solar Systems, Solon, Ohio

Filed Sep. 23, 1982, Ser. No. 422,155
Int. Cl.³ C23C *11/00, 13/00, 17/00*
U.S. Cl. 427—35 **60 Claims**



1. A method of designing a compositionally varied material comprising:

forming a matrix from at least a first type of atom having at least one physical property, designing a spatial pattern in said matrix, incuding at least a second type of atom or atoms or groups of said second type of atom or atoms at predetermined locations in said spatial pattern to form the material, forming nonequilibrium disordered local environments with at least some of said second type of atom or atoms or groups thereof and coupling or decoupling at least a second physical property of said second type of atom or atoms and said locations with said matrix physical property to produce one or more functions of said material.

25. A method of designing a compositionally varied material comprising:

forming a matrix from at least a first type of atom having at least one physical property and a second type of atom having at least a second physical property, said matrix including a plurality of layers of at least said first and second types of atom, designing a spatial pattern in said matrix, including at least a third type of atom or atoms or groups of said third type of atom or atoms at predetermined locations in said spatial pattern to form the material, said locations being at least in some of said plurality of layers or between succeeding ones of some of said plurality of layers, forming nonequilibrium disordered local environments with at least some of said third type of atom or atoms or groups thereof and coupling or decoupling at least a third physical property of said third type of atom or atoms and said locations with said matrix physical property to produce one or more functions of said material.

48. A method of designing a compositionally varied material comprising:

forming a matrix from at least a first type of atom having at least one physical property, said matrix including a plurality of layers of at least said first type of atom, designing a spatial pattern in said matrix, including at least a second and a third type of atom interleaved in a plurality of layers of at least said second type of atom and a plurality of layers of at least said third type of atom at predetermined locations in said spatial pattern to form the material, forming nonequilibrium disordered local environments with at least some of said second or third type of atoms and coupling or decoupling at least a second physical property of said second type of atom or at least a third physical property of said third type of atom and said locations with said matrix physical property to produce one or more functions of said material.

4,520,040

FERROMAGNETIC FILMS FOR HIGH DENSITY RECORDING AND METHODS OF PRODUCTION

Bernhard F. Cordts, Topsfield, Mass., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 15, 1983, Ser. No. 561,692
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—38 **12 Claims**

1. A method for fabricating a ferromagnetic film comprising the steps of:

providing a substrate of a material having low solubility for a selected ferromagnetic material;

implanting ions of the selected ferromagnetic material into a surface layer of said substrate; and

heating said substrate to permit growth of particles of said ferromagnetic material.

6. A method for fabricating a ferromagnetic film comprising the steps of:

providing a substrate of a material having low solubility for a selected ferromagnetic material;

depositing a thin layer of said selected ferromagnetic material on the surface of said substrate;

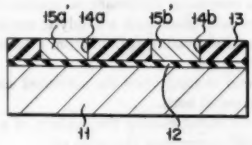
irradiating said layer of ferromagnetic material with an ion beam of an inert material so as to cause ion beam mixing of said ferromagnetic material into a surface layer of said substrate; and

heating said substrate to permit growth of particles of said ferromagnetic material.

4,520,041
METHOD FOR FORMING METALLIZATION STRUCTURE HAVING FLAT SURFACE ON SEMICONDUCTOR SUBSTRATE

Masaharu Aoyama, Fujisawa; Masahiro Abe, Yokohama; Takashi Ajima, Kamakura, and Toshio Yonezawa, Yokosuka, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Nov. 3, 1983, Ser. No. 548,440
Claims priority, application Japan, Nov. 4, 1982, 57-192491
Int. Cl.³ H01L *21/283, 21/302*
U.S. Cl. 427—88 **9 Claims**



1. A method for forming a metallization structure having a substantially flat surface on a semiconductor substrate, comprising the steps of:

forming a first insulating layer on said semiconductor substrate which has at least one semiconductor region formed therein, said first insulating layer having at least one contact hole through which said at least one semiconductor region is exposed;

forming a second insulating layer on said first insulating layer and in said contact hole;

selectively removing a predetermined portion of said second insulating layer including the portion in said contact hole formed in said first insulating layer, thereby forming at least one groove having a predetermined pattern corresponding to a desired interconnection pattern in said second insulating layer, said groove being formed to expose at a bottom thereof said contact hole formed in said first insulating layer;

forming a continuous metallic material layer on a remaining portion of said second insulating layer and in said groove formed in said second insulating layer and in said contact hole of said first insulating layer, said continuous metallic material layer having at least one groove corresponding to said groove in said second insulating layer;

applying an organic polymeric material having a predetermined flowability to said continuous metallic material layer, thereby covering said continuous metallic material layer with said polymeric material so as to form a layer of said polymeric material having a substantially flat surface; and

sequentially removing by ion etching said polymeric material layer and said metallic material layer along a direction of thickness thereof until said second insulating layer is exposed, thereby leaving said metallic material in said groove formed in said second insulating layer to provide at least one metallization layer comprising the remaining metallic material and having a surface level which is substantially the same as that of said second insulating layer, said metallization layer being connected to said semiconductor region through said contact hole.

4,520,042
HIGH-MODULUS, FLEXIBLE URETHANE COATING AND METHOD OF PREPARATION

Stuart B. Smith, Conyers, Ga., assignor to Thermocell Development, Ltd., Knoxville, Tenn.

Continuation-in-part of Ser. No. 505,793, Jun. 20, 1983, Pat. No. 4,452,829. This application Jan. 31, 1984, Ser. No. 575,677
Int. Cl.³ C08G *18/14, 18/20;* **B05D** *1/00, 1/05*
U.S. Cl. 427—209 **19 Claims**

1. A method of preparing a high-modulus, solid urethane coating, which method comprises spraying onto a substrate substantially equal-volume amounts of an A-side and a B-side admixture together, to provide for the reaction of said mixture in about 5 seconds or less, to produce a high-modulus, solid coating, the A-side mixture comprising 100 parts of a prepolymer prepared by reacting about 25 to 35 parts of a polyether triol, having a hydroxyl number of about 50 or less, with from 65 to 75 parts of a low functionality MDI having a functionality of about 2.4 or less, and the B side comprising a polyol composition of from about 5 to 40 parts of a diol and from 60 to 95 parts of a polyether triol having a hydroxyl number of about 50 or less, and a catalytic amount of a catalyst composition comprising from about 0.01 to 1 part of the polyol composition and composed of a tetravalent tin salt catalyst in combination with a heat-activatable polyamine catalyst.

12. A method of preparing a high-modulus, solid, urethane coating composition, which method comprises spraying onto a substrate and reacting together substantial equal volumes of an A- and a B-side mixture, the A-side mixture comprising 100 parts by weight of a prepolymer prepared by reacting an ethylene-oxide-capped polypropylene oxide triol with a low-functionality MDI, the MDI having an average functionality of about 2.0, to provide a prepolymer having about 20% to 22% free NCO, and the B-side mixture comprising from about 2 to 40 parts of a diethylene diol and 60 to 95 parts of an ethylene-oxide-capped polypropylene oxide triol having a hydroxyl number of about 50 or less, and a catalytic amount of a tetravalent tin salt catalyst in combination with a heat-activatable, formic-acid-blocked triethylene diamine, and an antifoaming amount of a degassing agent, the reaction to cream carried out in about 5 seconds or less.

4,520,043
METHOD OF PREVENTING CORROSION OF A METAL CASKET

Michael Davidian, 826 W. 79th St., Darien, Ill. 60559, assignor to Michael Davidian, Darien, Ill.

Division of Ser. No. 402,955, Jul. 29, 1982, Pat. No. 4,448,826. This application Jan. 9, 1984, Ser. No. 569,307
Int. Cl.³ B05D *7/22, 3/02*
U.S. Cl. 427—239 **2 Claims**

1. A method of preventing corrosion of a metal casket containing in use organic acids, comprising the steps of mixing a film forming material selected from the group of resins and rubber and finely divided particles of an alkaline material with an evaporable carrier to form an emulsion, applying the emulsion to the interior surface of a metal casket in the form of a coating, evaporating the carrier to form a dried coating on the casket containing dispersed particles of said alkaline material, and contacting the coating on the interior surface of said casket with a finite amount of organic acids contained in said casket to affect neutralization of said acids by said dispersed particles of the alkaline material and provide a substantially neutral system in said casket.

4,520,044
PRODUCTION OF COMPOSITE MEMBRANES

Sherman A. Sundet, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jul. 30, 1984, Ser. No. 635,746
Int. Cl.³ B05D *5/00*
U.S. Cl. 427—244 **4 Claims**

1. A process for forming a thin film composite membrane comprising forming a membrane from a solution of a polysulfone in a polar, organic solvent containing from 10 to 20% by weight polysulfone, quenching the resulting membrane in an aqueous bath containing 0.1 to 10% weight/volume m-phenylenediamine, removing the resulting porous polysulfone film containing m-phenylenediamine from the aqueous bath, and immersing said porous polysulfone film in a water immiscible solution comprising 0.05 to 5% weight/volume trimesoyl chloride, cyclohexane-1,3,5-tricarbonyl chloride, or mixtures

thereof whereby the m-phenylene diamine reacts with the trimesoyl chloride or cyclohexane-1,3,5-tricarbonyl chloride to form a continuous layer supported by the porous polysulfone membrane.

4,520,045

METHOD FOR IMPREGNATING A DIE-CAST ARTICLE WITH A SEALANT AND AN IMPREGNATION APPARATUS THEREFOR

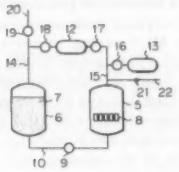
Tomoharu Kutsuna, Toyota; Shinzi Ohtani, Okazaki, and Kunimasa Kondo, Nagoya, all of Japan, assignors to Taiho Kogyo Co., Ltd. and Yugenkaisha Hakusui Sangyo, both of Aichi, Japan

Filed Dec. 20, 1983, Ser. No. 563,342

Claims priority, application Japan, Feb. 15, 1983, 58-22068; Apr. 14, 1983, 58-65885

Int. Cl.³ B05D *3/00*; C23C *13/08*

U.S. Cl. 427—294 **18 Claims**



1. A method for impregnating a die-cast article with a sealant, comprising the steps of:

preparing an impregnation vessel equipped with a first means for controlling the pressure therein, said means including a conduit and a pump;

preparing a sealant storage vessel equipped with a second means for controlling the pressure therein and being communicated with said impregnation vessel via a channel equipped with a valve;

locating said die-cast article within said impregnation vessel;

admitting said sealant into said sealant storage vessel while closing said valve of the channel;

operating said first pressure-controlling means so as to evacuate the air contained in said impregnation vessel and so as to degas the air contained in the cast defects of said die-cast article while said valve of the channel is closed;

operating said second pressure-controlling means so as to evacuate the air contained in said sealant storage vessel into which said sealant is admitted while said valve of the channel is closed;

while said valve of the channel is closed, operating at least one of said first and second pressure-controlling means so as to adjust the pressure in said impregnation vessel and the pressure in said sealant storage vessel to substantially the same level;

opening said valve, thereby permitting said sealant to flow solely by gravity from said sealant storage vessel into said impregnation vessel through said channel;

closing said valve of the channel so as to stop said flow of the sealant when said die-cast article is immersed in said sealant;

impregnating said sealant into said die-cast body;

creating a pressure difference between said sealant storage vessel and said impregnation vessel, said pressure difference being created, after said valve-opening step for the sealant to flow and, at the latest, before completion of the subsequent valve-opening and reflowing step; and

opening said valve of the channel and reflowing said sealant from said impregnation vessel into said sealant storage vessel through said channel, said reflowing being carried out essentially due to said pressure difference.

4,520,046

METAL PLATING ON PLASTICS

John E. McCaskie, North Merrick, and Chris Tsiamis, New York, both of N.Y., assignors to LeaRonal, Inc., Freeport, N.Y.

Filed Jun. 30, 1983, Ser. No. 510,428

Int. Cl.³ C23C *3/02*

U.S. Cl. 427—304 **16 Claims**

1. A process for metal plating the surface of a plastic or elastomeric material comprising the steps of

(a) gas-etching the surface of said material with sulfur trioxide,

(b) treating the etched surface with a conditioning agent comprising a non-ionic surfactant to render the surface acceptable for activation with a catalytic metal colloid,

(c) depositing said activating colloid from a colloidal metal solution, and

(d) plating a metal coating upon the activated surface from an electroless metal bath.

10. A process for metal plating the surface of a plastic or elastomeric material comprising the steps of

(a) subjecting the surface of said material to the gas-etching atmosphere of sulfur trioxide,

(b) controlling the gas-etching reaction to a point wherein the surface will accept a uniform deposit of an activating colloid,

(c) depositing said activating colloid from a colloidal activating metal solution, and

(d) plating a metal coating upon the activated surface from an electroless metal bath.

4,520,047

METHOD AND APPARATUS FOR THE RECOVERY OF SPRAYING SUBSTANCE WHEN SPRAYING ELONGATED ROLLED STOCK

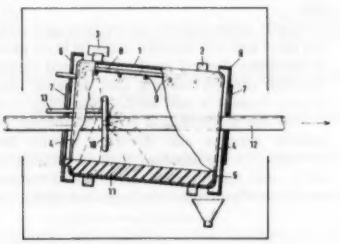
Herbert Hillemanns, Ratingen; Robert Samans, Düsseldorf, and Walter Meyer, Duisburg, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 21, 1982, Ser. No. 370,531

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3116368

Int. Cl.³ A21D *4/60*; B05D *7/16*; C10M *11/00*

U.S. Cl. 427—331 **3 Claims**



1. Method for the recovery of spraying substance in the continuous spraying of elongated rolled stock, more particularly when spraying tubes with corrosion-inhibiting coating materials, including substantially a binder, pigments, tar substances, and water as solvent or dispersant, comprising spraying the stock in a water-vapor saturated atmosphere; collecting the excess spraying substance and providing for the collected substance for re-use.

4,520,048

METHOD AND APPARATUS FOR COATING PAPER AND THE LIKE

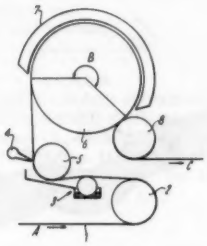
Alan E. Ranger, Kent, England, assignor to International Octrooi Maatschappij "Octropa" B.V., Netherlands

Filed Jan. 16, 1984, Ser. No. 571,278

Claims priority, application United Kingdom, Jan. 17, 1983, 8301189; Jan. 17, 1983, 8301191

Int. Cl.³ B05D *3/12, 1/28;* C23C *13/08;* B05B *5/00*

U.S. Cl. 427—350 16 Claims



1. A method of smooth coating permeable board comprising the steps of:

(a) applying to the face of the board a layer of coating composition comprising a coating material and aqueous carrier liquid;

(b) metering the composition over the face of the board;

(c) heating the coated board along a heating path to at least partially remove the water and dry the coating; and

(d) subjecting the opposite back surface of the board along the heating path to reduced pressure relative to the pressure at the face of the board simultaneously during the heating of the coated board according to step (c) to aid in the additional removal of water.

4,520,049

METHOD AND APPARATUS FOR COATING

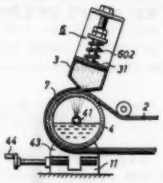
Takashi Nakanishi, Utsunomiya, Japan, assignor to Kao Corporation, Tokyo, Japan

Filed Dec. 9, 1983, Ser. No. 559,806

Claims priority, application Japan, Jan. 24, 1983, 58-9702; Mar. 24, 1983, 58-49415

Int. Cl.³ B05C *3/02;* B05D *3/12*

U.S. Cl. 427—356 14 Claims



1. A coating method comprising feeding base material into a gap defined between a coater die and a base material feeding roller and coating said base material with viscous material discharged from said coater die, the dimension of said gap between the coater die and the base material feeding roller being adjustably varied under action of a pressure at which said viscous material is discharged from the coater die in response to a variation in said pressure, wherein said coater die is located above and adjacent said base material feeding roller, is displaceable in a substantially vertical direction and is supported by a displacement control device, said displacement control device including a first upward adjustable biasing means for upwardly biasing said coater die away from said base material feeding roller and a second downward adjustable biasing means for downwardly biasing said coater die toward said base material feeding roller, whereby said coater die is vertically displaceable against the action of said displacement control device in accordance with the pressure at which viscous material is discharged from said coater die.

4,520,050

FINISH COMPOSITION FOR POLYESTER FIBER FOR RUBBER REINFORCEMENT

Shigemitsu Murase, Joyo, Japan, assignor to Unitika Limited, Osaka, Japan

Filed Sep. 16, 1983, Ser. No. 533,011

Claims priority, application Japan, Dec. 29, 1982, 57-234194

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—381 3 Claims

1. A method of producing polyester fiber with improved adhesion to rubber comprising:

(a) applying to the fiber a finish composition comprising an effective amount of lubricant and about 3 to 30 weight percent of the initial condensation product and its intermediate of a melamine resin;

(b) forming the treated fiber into cord;

(c) dipping the cord in a bath comprising a resorcinol-formaldehyde-latex;

(d) drying the cord; and

(e) curing the cord at a temperature of about 220° C.

4,520,051

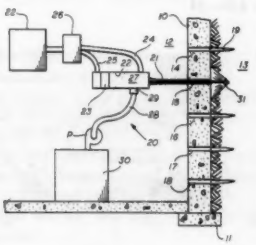
METHOD OF WATERPROOFING A POROUS WALL

George W. Harrison, Houston, Tex., assignor to Team, Inc., Houston, Tex.

Filed Jan. 3, 1984, Ser. No. 567,650

Int. Cl.³ B05D *5/00*

U.S. Cl. 427—387 2 Claims



1. A method of waterproofing a porous wall of a subterranean vault, wherein one side of the said wall is adjacent porous earth, which comprises the steps of:

(a) propelling a moisture activated, room temperature curable porable, self-leveling dimethylpolysiloxane or dialkylpolysiloxane which are generally referred to as silicone or TV rubber through said earth onto said side of said wall, and

(b) subjecting said resin to moisturizing conditions whereby said resin is activated to cure and form a water impervious flexible barrier adherent to said wall.

4,520,052

METHOD FOR ELECTROLESS COPPER-PLATING AND A BATH FOR CARRYING OUT THE METHOD

Jerzy Skowronek, Boktryckaregatan 35, Norrokoping, and Jan O. Persson, Trestegsgatan 59, S 603 63 Norrkoping, both of Sweden

Continuation-in-part of Ser. No. 392,048, filed as PCT SE 81/00366, Dec. 9, 1981, published as WO 82/02063, Jun. 24, 1982 § 102(e) date Jun. 25, 1982, abandoned.
This application Dec. 15, 1983, Ser. No. 561,618
Claims priority, application Sweden, Dec. 9, 1980, 8008634
Int. Cl.³ C23C *3/02*
U.S. Cl. 427—443.1 8 Claims

1. In a method for electroless copper plating comprising immersing the surface to be plated in a bath comprising an alkaline solution, having a pH of 11.5–13.5, of a cupric salt, a complexing agent for cupric (II) ions, a reduction agent of aldehyde type and additives to improve the stability of the bath and to lower its surface tension, the improvement wherein the bath additionally contains an oxide inclusion preventing agent of the formula

$$R'R''N—R_3—COOH$$

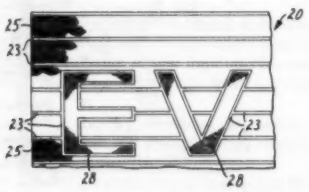
wherein R′ and R″ each is hydrogen or alkyl and R_3 is phenyl, the amino group and the carboxylic group being in para position with respect to each other whereby to provide high ductility of the deposited copper and resistance to heat shock.

4,520,053

LAYERED COMPOSITE FOR APPLYING GRAPHICS HAVING AREAS OR BOTH MIRROR-LIKE METAL AND PATTERNED APPEARANCE

Frank J. Marentic, Birmingham, Mich., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 10, 1983, Ser. No. 521,843
Int. Cl.³ B60R *13/0*
U.S. Cl. 428—31 16 Claims



1. A flexible layered composite comprising a strong, tough, flexible, dimensionally stable, transparent plastic film having

(a) a mirror-like, thin-film metal layer covering the first face of the plastic film,

(b) an opaque patterned layer covering the entire second face of the plastic film, and

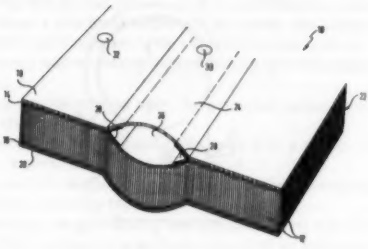
(c) an adhesive layer covering the opaque patterned layer, which mirror-like metal layer when selectively etched away, provides areas of both mirror-like metal and patterned appearance when the layered composite is mounted by its adhesive layer to a display surface.

4,520,054

FLEXIBLE HOLLOW BODY FILLABLE WITH FLUID MEDIUM

Claus-Peter Pfeiffer, Reinbek, Fed. Rep. of Germany, assignor to Metzeler Kautschuk GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 26, 1983, Ser. No. 535,874
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1982, 3235630
Int. Cl.³ B32B *1/02*
U.S. Cl. 428—35 5 Claims



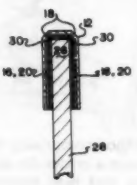
1. A flexible hollow body fillable with fluid medium for stiffening the body, comprising a double fabric having an upper web and a lower web and a multiplicity of pile filaments extending transversely to and mutually connecting sid upper and lower webs, said webs defining an inflatable chamber therebetween containing and limited in shape and size by said pile filaments, said webs respectively having an outer surface with a layer of elastomeric material disposed thereon, a coated cover fabric applied to one of said layers of elastomeric material, said cover fabric having strip-shaped regions detached from said layer of elastomeric material to which said cover fabric is applied so as to define therewith respective tubular chambers; angular strips disposed within said tubular chambers at respective edges thereof for joining said one layer of elastomeric material and said coated cover fabric to one another; said chambers being formed, respectively, with at least one inlet opening for inflating said chambers.

4,520,055

SPLIT LABEL INDEX TAB

Jack W. Jeter, Akron, Ohio, assignor to Jeter Systems Corporation, Akron, Ohio

Filed May 31, 1983, Ser. No. 499,339
Int. Cl.³ B32B *3/10*; G09F *3/04*
U.S. Cl. 428—55 7 Claims



1. A label, comprising:

a flexible film;

a face sheet adhesively secured on one surface to said flexible film, coextensive with said flexible film, and having a plurality of parallel cuts therethrough, said parallel cuts dividing said face sheet into at least three separate individual pieces, and said parallel cuts being spaced from about 0.012 to about 0.017 inches apart; and

a pressure sensitive adhesive positioned on the other surface of said face sheet;

wherein said label is adapted for flush application to the edge of a substrate, said parallel cuts being positionable about the corner of said edge.

5. A process for making a label, comprising:

adhering a sheet of paper face stock to a silicone coated paper backing with a pressure sensitive adhesive;

introducing parallel cuts through said paper face stock, said parallel cuts being spaced apart from about 0.012 to about 0.017 inches;

adhesively securing over said face stock a flexible film, producing a laminate; and

cutting labels from said laminate.

4,520,056

GAS PERMEABLE-LIQUID IMPERMEABLE MEMBRANES CONFINED WITHIN A RECESS

Donald Jackrel, 5 Maison Ct., Holbrook, N.Y. 11741

Division of Ser. No. 418,574, Sep. 15, 1982, Pat. No. 4,430,759. This application Aug. 25, 1983, Ser. No. 526,472

Int. Cl.³ B32B *1/04, 3/00*

U.S. Cl. 428—68 **4 Claims**

1. An article of clothing designed to surround a portion of the body comprising an outer layer, an intermediate layer, and an inner layer, said inner layer being situated within said outer layer, means for joining said inner and outer layers to define a recess within which said intermediate layer is confined, without interrupting the integrity of the intermediate layer or bonding same to either of said inner or outer layers, said intermediate layer comprising first and second gas permeable liquid impermeable membranes sealed to form an insert having the general shape of the portion of the body which the article is designed to surround.

4,520,057

COMPOSITE PLATE

Hideichi Fujii, Kobe; Chiyoki Yamane, and Fumio Kawai, both of Osaka, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo and Koshii & Co., Ltd., Osaka, both of, Japan

Filed Dec. 22, 1983, Ser. No. 564,414

Claims priority, application Japan, Dec. 28, 1982, 57-234435

Int. Cl.³ B32B *1/04, 3/02, 15/10*

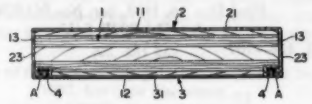
U.S. Cl. 428—68 **4 Claims**

1. A relatively light-weight structural member resistant to fire, generation of smoke and impervious to moisture comprising:

a substantially flat wood core defined by a top surface, a bottom surface and side surfaces;

top and bottom metallic plates covering said top and bottom surfaces of said wood core and metallic sides integral with said top and bottom plates covering said side surfaces of said wood core;

said top and bottom metallic plates being provided with integral overlapping-sealed joint portions to seal said



metallic plates about said wood core; the overlapping parts of said joint portions being bent towards said wood core to form edges which abut one another, said edges being welded together to form a complete seal about said wood core.

4,520,058

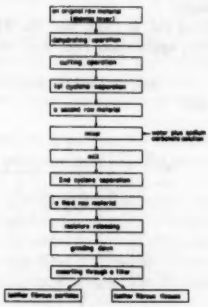
METHOD FOR PRODUCING LEATHER FIBROUS TISSUES PLANTED ON A BASIC CLOTHING SHEET AND SHEET PRODUCTS PRODUCED THEREBY

Yoshiro Okabe, 6-12-19, KamiHigashi, Hirano-ku, Osaka, Japan

Filed Apr. 18, 1983, Ser. No. 485,637

Int. Cl.³ B05D *1/16*

U.S. Cl. 428—90 **6 Claims**



1. A method of producing a sheet having leather fibrous tissues adhered thereto, comprising the steps of

dehydrating animal leather scraps in the form of original first raw material until water content thereof is lowered to the range between 20 to 40 percent by weight;

cutting a dehydrated amount of said leather scraps into short lengths by means of a cutter having sharp blade edges, thereby to obtain a second raw material;

adding water to said second raw material while agitating said second material;

setting an agitated amount of said second raw material to a mill and milling said second raw material until said agitated second material is substantially completely turned into a fibrous state, thereby to obtain a third raw material;

dehydrating an amount of said third raw material until water content thereof is lowered to less than 40 percent by weight;

smashing a dehydrated amount of said third raw material into substantially shorter lengths;

filtering a smashed amount of said third raw material into assortment; and

adhering said filtered third raw material onto said sheet.

4,520,059

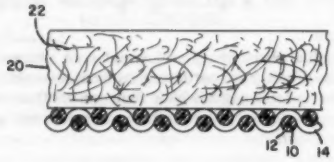
IONOMER-COATED YARNS AND THEIR USE IN PAPERMAKERS WET PRESS FELTS

James D. Worrall, East Greenwich, and Ronald E. Tefft, Rockville, both of R.I., assignors to Engineered Yarns, Inc., Coventry, R.I.

Filed Dec. 16, 1983, Ser. No. 562,076

Int. Cl.³ B32B *5/12*

U.S. Cl. 428—109 **12 Claims**



1. A papermakers' felt of the batt-on-mesh type having a mesh layer which comprises synthetic yarns coated with an ionomer resin so that said mesh layer is resistant to abrasion and compression.

4,520,060

METHOD FOR FABRICATING A MASTER PLATE AND A MASTER PLATE FABRICATED THEREBY HAVING FITTING BORES DISPOSED AT PRESPECIFIED COORDINATE INTERVALS

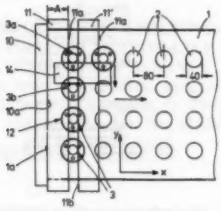
Rudi Blümle, Schwarzbachstr. 52, D-7000 Stuttgart 80, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,053

Claims priority, application Fed. Rep. of Germany, Jan. 15, 1983, 3301178

Int. Cl.³ B32B *3/10*

U.S. Cl. 428—131 **14 Claims**



1. A method for producing a master plate having highly accurate fitting bores for fitting pins disposed at pre-specified coordinate intervals in order to form a grid system, for use as an initial template gauge plate for making clamping plates for grid-type clamping systems, comprising

drilling preliminary bores in a foundation plate at a specified dimension of grid intervals with normal accuracy and with a greater diameter than an outer diameter of said fitting bores,

forming a plurality of fitting sleeves each with an end flange having an outer diameter which is greater than said preliminary bores in precise coaxial alignment with an inner bore of said fitting sleeves with an outer diameter of said sleeves of lesser diameter than said preliminary bores in said foundation plate,

inserting said fitting sleeves into said previously drilled preliminary bores in said foundation plate thereby forming an annular interspace between the outer diameter of said fitting sleeves and said preliminary bores in said foundation plate,

accurately positioning the fitting sleeves in a given precise position in said preliminary bores by measurement and positioning said sleeves in both the X and Y directions with equal measurements between each of said sleeves in both the X and Y directions,

mechanically pre-fixing said sleeves in their given precise position which has been located by measurement in both the X and Y directions,

and introducing a settable plastic material into the annular interspace between the outer circumference of said fitting sleeves and said preliminary bores and permitting the plastic material to harden thereby fixing said sleeves in their precise position in both the X and Y direction.

11. A master plate, produced by the method defined by claim 1, characterized in that insertable fitting sleeves held in rough preliminary bores by means of a hardened plastic material are disposed in it at the grid intervals, with each of said sleeves having a fitting bore for receiving a fitting pin and an annular flange on one end face, which annular flange rests with its outer rim on the contact face of the foundation plate.

4,520,061

ADAPTER BLOCK AND A MOLD FOR PRODUCING SUCH BLOCKS BY FOAM MOLDING

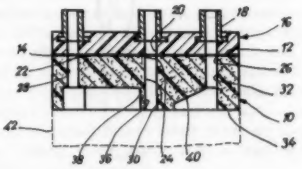
Kurt Stoll, Lenzhalde 72, D-7300 Esslingen, Fed. Rep. of Germany, and Hans-Heinrich Glättli, Seestrasse 252, Ch-8700 Küsnacht, Switzerland

Division of Ser. No. 385,254, Jun. 4, 1982,. This application Aug. 17, 1983, Ser. No. 524,042

Claims priority, application Fed. Rep. of Germany, Jun. 19, 1981, 3124020

Int. Cl.³ F16L *47/00*; B32B *3/10*; B29C *1/06*

U.S. Cl. 428—137 **10 Claims**



1. An adapter block for use in a fluid system, comprising first and second parts and adhesive means for securing said first and second parts together; wherein said first part is made of a plastic material, has a recess provided in a first surface thereof, and has a connecting bore which extends therethrough from a second surface thereon to said recess in said first surface, said plastic material being an integral skin foam material which includes a foam core and a solid exterior skin integral with said foam core; and wherein said first part has said second surface on a side thereof which has been mechanically roughened, said second part being secured by said adhesive means to said second surface of said first part.

4,520,062

TRANSFER COATING OF ABRASION-RESISTANT LAYERS

Israel S. Ungar; Herbert I. Scher, both of Randallstown, and Nelson L. O'Neill, Crofton, all of Md., assignors to Nevamar Corporation, Odenton, Md.

Continuation-in-part of Ser. No. 442,070, Nov. 16, 1982,. This application Sep. 2, 1983, Ser. No. 529,187

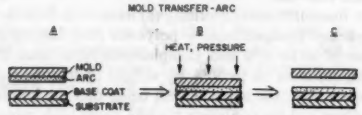
Int. Cl.³ D06N *7/04*; B41C *1/06*; B32C *3/00*

U.S. Cl. 428—148 **19 Claims**

1. A process for providing an abrasion-resistant deposit on the surface of a substrate, comprising

providing a transfer carrier coated with an ultra-thin deposit consisting essentially of a non-resinous binder material, a small quantity of finely divided solid lubricant and mineral

abrasive particles, which ultra-thin deposit has been dried on said transfer carrier at a temperature of at least 140° F., transferring said dried ultra-thin deposit from said transfer carrier to the surface of a substrate under conditions of heat and pressure whereby said deposit becomes adhered to said substrate, and



removing said transfer carrier.

8. A process according to claim 1, wherein said surface of said substrate is a thermosettable material, a thermoplastic, paper or a wood product.

4,520,063

FORGERY-PROOF FLAT ARTICLE OF A SYNTHETIC RESIN, AND PROCESS FOR THE PRODUCTION THEREOF

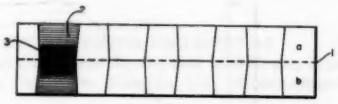
Manfred Simon, Niederkassel; Karl-Heinz Spiess, Much-Schwellenbach, and Richard Weiss, Troisdorf, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Jul. 20, 1982, Ser. No. 400,006

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1981, 3129400

Int. Cl.³ D06P *5/02*

U.S. Cl. 428—195 **8 Claims**



1. A process for the production of forgery-proof flat articles with security features analogous to watermarks from at least one synthetic resin transparent, translucent, or colored sheet, which comprises applying at least two different colorants, at least one of which is capable of quickly migrating, onto the surface of a sheet of the flat article formed of synthetic resin in the presence of a crosslinkable component in the flat article and/or in the colorant application, and subsequently crosslinking the crosslinkable component when the desired migration depth has been reached for the applied colorant in the flat article, the at least one migrating colorant penetrating at least a part of resin material of the flat article being fixed by crosslinking in corresponding with the selected security feature in the form of a pattern, motif, or lettering, said colorants providing a security feature in a congruent fashion on both sides of the flat article; said composite flat article being produced by laminating a first sheet with a second sheet made of the same synthetic resin material as the first sheet, and the colorants being applied to one of the sheets so that color application lies between the two sheets, a migration of the at least one migrating colorant taking place into both sheets; the faster migrating colorant being an organic luminescent dye, whereby the security feature selected can be discerned under normal light only when the article is held up to the light but, in case of UV light of specific wavelengths, the security feature can also be recognized in a top view of the article.

4,520,064

DECORATIVE PLAQUES AND PROCESS

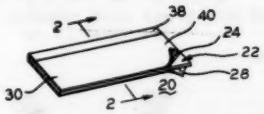
James C. Kanzelberger, Riverside, Ill., assignor to Contemporary, Inc., Riverside, Ill.

Division of Ser. No. 770,797, Feb. 22, 1977, which is a continuation of Ser. No. 579,419, May 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,166, Mar. 25, 1974, Pat. No. 3,940,864. This application May 31, 1977, Ser. No. 801,863

The portion of the term of this patent subsequent to Nov. 14, 1995, has been disclaimed.

Int. Cl.³ B32B *23/00*; B41M *3/12*

U.S. Cl. 428—199 **4 Claims**



1. A material which simulates engraved metal and which may be engraved by a hot die of the type used in a hot stamping process, said material comprising a solid non-porous debossing layer of a self-supporting rigid thermoplastic material substantially free of any voids and having heat-deformable characteristics such that said material debosses under the heat and pressure of a hot stamping die, a first non-heat-conductive polyester film layer bonded to and covering the top of said self-supporting, solid, and rigid debossing material to contain and follow said thermoplastic material as it deforms responsive exclusively to dry heat and pressure of a hot die, and a second stabilizing layer bonded to and covering the bottom of said debossing self-supporting, solid, and rigid material to control displacement near the top of said thermoplastic material and to prevent displacement near the bottom of said thermoplastic material.

3. A product made by a process for engraving a laminate responsive to a hot stamping process, said process comprising the steps of:

(a) first forming a self-supported, separate, and independent solid layer of rigid thermoplastic material approximating the thickness of an engraved metal plate, said thermoplastic material having heat deformable characteristics such that said material debosses under the dry heat and pressure of a hot stamping die;

(b) laminating onto the upper side of said first formed self-supporting, solid, and rigid layer a first polyester film covering which withstands the dry heat and pressure of said hot stamping die, said film covering following and containing said thermoplastic material as it debosses responsive to the dry heat of said hot die to form an imprintable surface, said polyester film having a surface characteristic which receives ink from an overlying hot stamping foil when said hot stamping die is pressed against said foil;

(c) laminating onto the lower side of said first formed self-supporting, solid, and rigid layer a second covering material which stabilizes the back of said thermoplastic material while the upper side debosses as the thermoplastic material flows laterally under the dry heat and pressure of said hot die; and

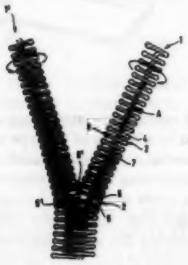
(d) locally applying the dry heat and pressure of said hot stamping die to said first covering film to deboss said first formed self-supporting, solid, and rigid thermoplastic material and generally supporting the second covering material to preclude deformation of said thermoplastic material, except where said dry heat and pressure are locally applied, said ink transferring from said hot stamping foil to said polyester film under the dry heat of said die simultaneously with said debossment.

4,520,065

FLAT LINK BAND OF WIRE COILS, WIRE COIL FOR THE PRODUCTION OF SUCH A LINK BAND AND PROCESS FOR THE PRODUCTION OF SUCH A WIRE COIL

Reinhard W. Leo, Giessener Strasse 38, 6057 Dietzenbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 328,119, Dec. 7, 1981, abandoned. This application Jul. 11, 1984, Ser. No. 629,988
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1980, 3047989
Int. Cl.[3] B21F *27/00*; D02G *3/00*; D03D *13/00*
U.S. Cl. 428—222 10 Claims



1. In a flat link band of wire coils fabricated from a plastic material, wherein each turn of each wire coil comprises a head part and a foot part so that adjacent wire coils are adapted to be detachably held together by an insert wire thrust into respective interengaging head and foot parts of adjacent wire coils, the head and foot parts being substantially identical to one another with each of the head and foot parts defining a reverse loop of each turn of each wire coil, each head and foot part extending over one side of their respective wire coil with a substantially straight first shank section which extends into a corresponding straight first shank section of a connecting turn of each respective wire coil, and each head and foot part extending over the opposite side of their respective wire coil with a substantially straight second shank section, an improvement comprising:

said head part and its associated first and second shank sections of said each turn of each wire coil being substantially disposed in a first plane substantially perpendicular to respective longitudinally extending wire coil axis;

said foot part and its associated first and second shank sections of said each turn of each wire coil being substantially disposed in a second plane substantially perpendicular to said respective longitudinally extending wire coil axis;

said first plane being spaced apart from and substantially parallel to said second plane;

a central winding section of said each turn of each wire coil connecting said second shank section of said head part to said second shank section of said foot part, said central winding section extending substantially in the same direction as said respective longitudinally extending wire coil axis, and said central winding section having a predetermined axial length which substantially determines the pitch of each wire coil respectively; and

said axial length of said central winding section having a minimum length at least slightly greater than the thickness of either of said head and foot parts thereby avoiding any longitudinal tension on said respective interengaging head and foot parts of said adjacent wire coils.

4,520,066

POLYESTER FIBREFILL BLEND

Graham Athey, Harrogate, England, assignor to Imperial Chemical Industries, PLC, London, England

Filed Jan. 14, 1983, Ser. No. 458,012
Claims priority, application United Kingdom, Mar. 8, 1982, 8206693
Int. Cl.[3] D04H *1/04, 1/54, 1/62, 1/72*
U.S. Cl. 428—288 2 Claims

1. A fibrefill blend comprising (a) from 90 to 50% by weight of slickened crimped hollow polyester fibre having a cavity volume of 10 to 30% and, complementally, to total 100% by weight, (b) from 10 to 50% by weight of slickened crimped conjugate fibre, the improvement being that the hollow polyester fibres and the conjugate binding fibres have substantially the same density and decitex (and so diameter) and that the conjugate fibre comprises a polyester core and a polyolefin sheath.

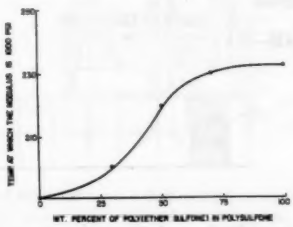
2. A thermally bonded batt formed from the fibrefill blend of claim 1.

4,520,067

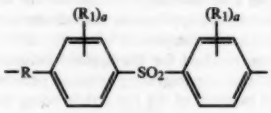
COMPOSITION USEFUL FOR MAKING CIRCUIT BOARD SUBSTRATES AND ELECTRICAL CONNECTORS

James E. Harris, Piscataway, and Lloyd M. Robeson, Whitehouse Station, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

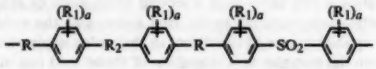
Continuation of Ser. No. 391,422, Jun. 23, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,863
Int. Cl.[3] B32B *5/16, 27/06, 15/04*
U.S. Cl. 428—323 12 Claims



1. A circuit board substrate comprising from about 40 to about 90 weight percent of a poly(ether sulfone) of the following formula:



and from about 10 to about 60 weight percent of a polysulfone of the following formula:



wherein R is selected from O and S an each R_1 independently hydrogen, a halogen atom, an alkyl group of from 1 to 4 carbon atoms and an alkoxy group of from 1 to 4 carbon atoms, a is an integer of 0 to 4 and R_2 is a bond between aromatic carbon atoms or a divalent connecting radical.

2. A circuit board substrate as defined in claim 1 wherein the substrate further contains a particulate inorganic filler.

4,520,068

REINFORCED SUPPORT SHEET AND METHOD FOR MAKING SAME

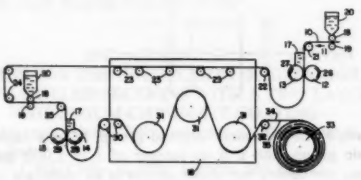
Horst Sommer, Musberg, and Hansgeorg Gronle, Filderstadt, both of Fed. Rep. of Germany, assignors to Elring Dichtungswerke GmbH, Fellbach, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 415,812, Sep. 8, 1982, Pat. No. 4,478,887. This application Oct. 3, 1983, Ser. No. 538,105

Claims priority, application Fed. Rep. of Germany, Sep. 11, 1981, 3136015; Oct. 21, 1982, 3239010

Int. Cl.³ F16J *15/10*; C08L *1/00*

U.S. Cl. 428—324 **11 Claims**



1. A reinforced support sheet for use in making flat gaskets comprising:

a sheet-like, smooth support material; and

a layer of vulcanizable soft material covering each of the sides of said sheet-like support material, said soft material layers being comprised of 80% by weight of an asbestos-free, mineral base material in powder form, and also including up to a maximum of 14% by weight of abestos-free fiber-like base material, and about 6% by weight of synthetic rubber binder material.

4,520,069

MAGNETIC RECORDING MEDIUM

Tatsuji Kitamoto, and Goro Akashi, both of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed May 6, 1982, Ser. No. 375,691

Claims priority, application Japan, May 7, 1981, 56-67639

Int. Cl.³ G11B *5/70*; B32B *5/30*

U.S. Cl. 428—328 **7 Claims**

1. A magnetic recording medium having a high signal-to-noise ratio in high density recording and a high output in short wavelength recording and comprising a non-magnetic support and a magnetic recording layer coated thereon in which ferromagnetic particles having an oval form are dispersed in a non-magnetic binder, characterized in that the ferromagnetic particles have a mean particle length of at most 0.3 micron with a length to width ratio of more than 1 but at most 3, and are subjected to an orientation treatment in the vertical direction to the recording surface.

4,520,070

MAGNETIC RECORDING MEDIUM AND PROCESS FOR PRODUCING SAME

Nobuyuki Yamamoto, Shizuoka; Yasuo Nishikawa, Kanagawa; Kyoichi Naruo, and Tsutomu Okita, both of Shizuoka, all of Japan, assignors to Fuji Photo Film Company Limited, Kanagawa, Japan

Filed Feb. 19, 1982, Ser. No. 350,509

Claims priority, application Japan, Mar. 24, 1981, 56-43388

Int. Cl.³ H01F *10/02*; B05D *5/12*

U.S. Cl. 428—336 **17 Claims**

1. A magnetic recording medium consisting essentially of:

a non-magnetic support base;

a thin magnetic metal layer formed on a surface of said non-magnetic support base; and

a layer consisting essentially of a compound containing at least two isocyanate groups formed on either said thin magnetic metal layer or the surface of said non-magnetic support base opposite said thin magnetic metal layer or both, in order to improve wear resistance and running properties.

4,520,071

SPHERICAL POROUS POLYIMIDE POWDER

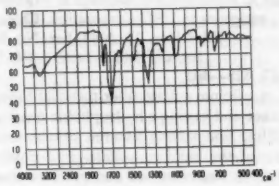
Yuzuru Noda, and Toshio Nakajima, both of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 4, 1984, Ser. No. 616,760

Claims priority, application Japan, Apr. 18, 1984, 59-78936

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—402 **10 Claims**



1. A spherical porous polyimide powder which is thermally infusible and is insoluble in an organic solvent, comprising spherical porous particles of a weight average particle diameter of 1 to 20 μm comprising an aromatic polyimide having an inherent viscosity measured in sulfuric acid at a concentration of 0.5 g/dl at temperature of 30±0.01° C. of 0.1 to 2.0, wherein a packed bulk density is 100 to 600 g/l and a specific surface area measured by a nitrogen absorption method is 1 m^2/g or more.

4,520,072

HETEROGENEOUS SYSTEM PHOTOSENSITIVE OXIDATION SENSITIZER

Akira Yoshino, Fujisawa, and Isamu Iwami, Zushi, both of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 121,586, Feb. 14, 1980, abandoned. This application Mar. 30, 1982, Ser. No. 363,607

Claims priority, application Japan, Feb. 28, 1979, 54-21829; Aug. 27, 1979, 54-108156; Nov. 7, 1979, 54-143241; Nov. 7, 1979, 54-143242

Int. Cl.³ B01D *39/08*; B32B *5/16*

U.S. Cl. 428—403 **6 Claims**

1. A heterogeneous system photosensitive oxidation sensitizer prepared by the steps comprising:

(i) providing a coloring substance having a light resistance test value of from Rating No. 4 to No. 8 and a substance capable of serving as a solvent medium for said coloring substance;

(ii) allowing the coloring substance to dissolve or molecularly disperse completely in the solvent medium, the formation of the solution or the molecular dispersion result-

ing in the coloring substance becoming photosensitively active; and

(iii) allowing the photosensitively active coloring substance to be absorbed on a carrier therefor so that the resulting sensitizer has a photosensitivity as ΔDO value of at least 0.5, determined by dissolving a predetermined amount of the sensitizer in water having a predetermined oxygen concentration and applying a predetermined intensity of irradiation to the resulting solution.

2. A sensitizer according to claim 1, wherein the carrier is in the form of powders.

3. A sensitizer according to claim 1, wherein the carrier is in the form of granules.

4,520,073

PRESSURE COATING OF MINERAL FILLERS

Donald A. Randolph, and Kenneth R. Watkins, both of Wheaton, Ill., assignors to USG Corporation, Chicago, Ill.

Filed Dec. 23, 1983, Ser. No. 565,197
Int. Cl.³ B05D *3/02, 3/04, 7/00*
U.S. Cl. 428—405 **14 Claims**

13. A calcium sulfate filler material having enhanced water resistance and having a hydrophobic coating thereon penetrating, filling and sealing tissures, cracks, and interstices in the surface of the calcium sulfate, said coating comprising the dried solids steam carried and pressure impregnated onto the calcium sulfate by mixing the calcium sulfate and about 0.01% to about 5.0% by weight of hydrophobic coating material under low intensity agitation at a temperature between about 32°–275° C. and steam pressure between about 10–100 psig for at least about 1 minute and drying the wet coated calcium sulfate.

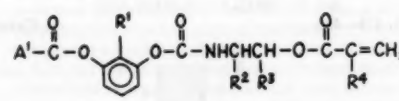
14. The filler of claim 13 in which the coating material comprises polydimethyl siloxane.

4,520,074

POLYMERIZABLE 3-AROYLOXYPHENYL CARBAMATES AND METHODS FOR THEIR PREPARATION AND USE

Timothy W. O'Donnell, and Daniel R. Olson, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 20, 1984, Ser. No. 632,732
Int. Cl.³ B32B *27/36;* **C07C** *69/76*
U.S. Cl. 428—412 **21 Claims**



1. A polymerizable 3-aroyloxyphenyl carbamate having formula I in the drawings, wherein A^1 is an aromatic radical; each of R^1, R^2 and R^3 is independently hydrogen or an alkyl radical containing up to 4 carbon atoms; and R^4 is hydrogen or a lower alkyl radical.

14. A solid article of manufacture comprising:

(A) a resin base, and

(B) a surface coating on at least a part of

said resin base, said surface coating comprising an addition polymer containing structural units of formula IV, wherein Z is at least one moiety selected from the group consisting of those having formulas V and VI; A^1 is an aromatic radical; each of R^1, R^2 and R^3 is independently hydrogen or an alkyl radical containing up to 4 carbon atoms; and R^4 is hydrogen or a lower alkyl radical.

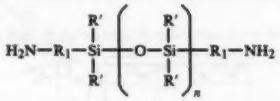
4,520,075

SILOXANE-MODIFIED POLYIMIDE PRECURSOR AND POLYIMIDE

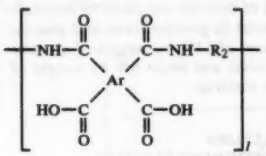
Kazumasa Igarashi; Katsuhiko Yamaguchi; Kazuo Iko, and Kazuyuki Miki, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

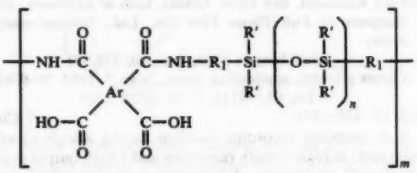
Continuation of Ser. No. 528,927, Sep. 2, 1983, abandoned. This application Sep. 25, 1984, Ser. No. 654,517
Int. Cl.³ C08G *73/10*
U.S. Cl. 428—435 **28 Claims**

1. A siloxane-modified polyimide precursor which can be converted into a polyimide having excellent adhesion and moisture resistance, the precursor being a reaction product prepared by simultaneously polymerizing (a) a diaminosiloxane represented by the formula



wherein R_1 is a divalent organic group, R′ is a monovalent organic group, and n is an integer of 1 to 1,000, and (b) a diamine containing no silicon atoms in its molecule with (c) 3,3′,4,4′-biphenyltetracarboxylic dianhydride in an inert organic solvent, wherein the diaminosiloxane is used in an amount of 1 to 4 mole % per mole of the total diamino compounds and such that the silicon content in the reaction product is 0.5 wt. % or less, the precursor having the formula





wherein R_1, R′ and n are the same as defined above; R_2 is a divalent organic group containing no silicon atoms; Ar is a tetravalent biphenyl organic group; and l and m are positive integers with the proviso that m/l+m=0.01 to 0.04.

4,520,076

MAGNETIC RECORDING MEDIUM

Seitoku Saito; Toshiaki Izumi; Takayoshi Kobuke, and Hiroshi Sugihara, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed May 14, 1981, Ser. No. 263,587
Claims priority, application Japan, Jun. 3, 1980, 55-73732
Int. Cl.³ H01F *10/02*
U.S. Cl. 428—611 **5 Claims**

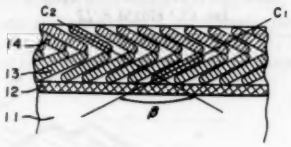
1. A magnetic recording medium comprising:

a non-magnetic substrate;

a plurality of magnetic layers deposited on said non-magnetic substrate;

said magnetic layers being formed of magnetic particles having a shape with a major axis, said major axis arranged at a tilt angle to the perpendicular of said substrate;

wherein the tilt angle of all particles in the same layer is the same and the tilt angle for particles in adjacent layers is equal in magnitude but in opposite directions from said



perpendicular, and wherein said major axes of said magnetic particles in the adjacent magnetic layers are crossed at an angle ranging from 20° to 160°.

4,520,077

PROCESS FOR THE PROTECTION OF GALVANIZED STEEL ROLLED SECTIONS WITH A TWO LAYER CHROMIUM-CHROMATE COATING

Carlo Lavezzari, Varzi, Italy, assignor to Zincroksid S.p.A., Turin, Italy

Filed Mar. 2, 1984, Ser. No. 585,856
Claims priority, application Italy, Mar. 3, 1983, 19880 A/83
Int. Cl.³ C25D *5/12, 11/38*
U.S. Cl. 428—632 **8 Claims**

1. A process for the protection of flat steel rolled sheets previously plated with zinc or zinc containing alloys comprising: depositing on the surface of the previous plating a layer of chromium metal having a thickness of at least about 0.55 g./m.^{2} by electrodeposition; and then depositing on the surface of the layer of chromium metal a layer of chromium oxide by electrodeposition, wherein the chromium oxide layer has a thickness of at least about 0.035 g./m.^{2} and the weight ratio of the chromium metal to the chromium contained in the chromium oxide in the respective deposits is from 25:1 to 4:1.

8. A product obtained by means of the process according to claim 1 in which the flat rolled sheet section is in the form of a roll, plate, or sheet up to 2500 mm. wide and up to 10 μm. thick, having at least one of its sides previously plated with a zinc or zinc alloy plating of a thickness of from 1 μm to 100 μm, and in which successive electrolytic treatments have been carried out on at least one previously plated side.

4,520,078

CORES FOR ELECTROMAGNETIC APPARATUS AND METHODS OF FABRICATION

Mario Rabinowitz, Redwood City, and E. Robert Perry, Portola Valley, both of Calif., assignors to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Jun. 8, 1981, Ser. No. 271,420
Int. Cl.³ H01F *41/02*; B23K *20/08*
U.S. Cl. 428—636 **4 Claims**

1. A method of making an amorphous metal core for use in an electrical induction device such as a transformer, said method comprising the steps of: initially providing appropriate amorphous metal material in the form of a continuous strip for use as said core; winding said continuous strip of material into an unsolidified, preliminary shape; and thereafter, while said unsolidified wound strip of material is in said preliminary shape, explosion bonding said material into a solidified final shape without causing the amorphous material to recrystallize, whereby to increase its density substantially and therefore improve its permeability and field saturation characteristics.

4,520,079

MAGNETIC RECORDING MEDIUM

Kaoru Nakajima, Izumi, and Seiichi Miyai, Tagajyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

PCT No. PCT/JP82/00410, § 371 Date Jun. 14, 1983, § 102(e) Date Jun. 14, 1983, PCT Pub. No. WO83/01528, PCT Pub. Date Apr. 28, 1983
PCT Filed Oct. 15, 1982, Ser. No. 509,443
Claims priority, application Japan, Oct. 15, 1981, 56-164667
Int. Cl.³ G11B *5/70*
U.S. Cl. 428—694 **4 Claims**

1. In a magnetic recording medium comprising a magnetic layer containing magnetic powder and a binder attached to a non-magnetic substrate, the improvement which comprises:

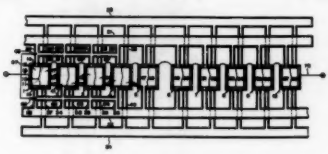
employing in the binder of at least 1% by weight of the total amount of binder of a graft polymer produced by reacting a graft polymerizable polymer with a polymerizable unsaturated compound containing a sulfonic group or a metal sulfonate under the influence of ionizing radiation, said polymerizable unsaturated compound is present in an amount of from 0.1 to 10 parts by weight per 100 parts by weight of said graft polymerizable polymer.

4,520,080

ELECTROLYTES CIRCULATION TYPE CELL STACK SECONDARY BATTERY

Takafumi Hashimoto, Tokyo, Japan, assignor to Meidensha Electric Mfg. Co., Ltd., Tokyo, Japan

Filed May 3, 1982, Ser. No. 374,077
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—18 **14 Claims**



1. An electrolyte circulation type cell stack secondary battery comprising:

(a) a first common manifold means through which a cathode electrolyte is supplied into said cell stack;

(b) a second common manifold means through which said cathode electrolyte exits from said cells stack;

(c) a third common manifold means through which an anode electrolyte is supplied into said cell stack;

(d) a fourth common manifold means through which said anode electrolyte exits from said cell stack;

(e) a plurality of at least three cells electrically connected in series between an anode terminal and a cathode terminal of the battery and in fluid connection in parallel between said respective manifolds, said respective cells being composed of a cathode chamber and an anode chamber which are divided by ion transmission separation means, said cathode chambers each being in fluid communication with said first common manifold means through first inlet channels extending between respective ones of said cathode chambers and said first common manifold means, said cathode chambers each being in fluid communication with

said second common manifold means through first outlet channels extending between respective ones of said cathode chambers and said second common manifold means, said anode chambers each being in fluid communication with said third common manifold means through second inlet channels extending between respective ones of said anode chambers and said third common manifold means, said anode chambers each being in fluid communication with said fourth common manifold means through second outlet channels extending between respective ones of said anode chambers and said fourth common manifold means;

(f) shunt current preventing means located at the lowest-cathodic potential side of said cell stack and having first and second electrodes respectively disposed in a first inlet channel and in a first outlet channel, each of said inlet and outlet channels being in fluid communication with the lowest-cathodic potential cell in said cell stack, each of said electrodes connected electrically to said cathode terminal; and

(g) first passage means interconnecting said respective first inlet channels on a lower cathodic potential side of the cell stack and second passage means interconnecting said respective first outlet channels on said lower cathodic potential side of the cell stack, said lower cathodic potential side of the cell stack having a potential lower than an intermediate potential value between the cathode and anode terminals.

4,520,081

HYDROGEN/BROMINE CELL

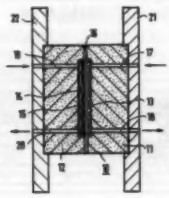
Karl Höhne, Erlangen, and Gerd Starbeck, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich and Berlin, Fed. Rep. of Germany

Filed Oct. 28, 1983, Ser. No. 546,447

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241801

Int. Cl.³ H01M *8/18*

U.S. Cl. 429—19 **13 Claims**



1. A hydrogen/bromine cell for storing and producing electricity comprising: two cell frame halves made of graphite, each half having a face surface with a recess and a back surfaces, and, the face surface of the cell frame halves being positioned so as to face each other;

an electrode mounted inside each recess, one electrode being a bromine electrode and the other being a hydrogen electrode;

a nonporous pyrographite layer covering at least the surface of the recess of the cell frame half surrounding the bromine electrode;

a cation exchanger diaphragm mounted between the two cell frame halves, said diaphragm separating the two electrodes from each other;

said cell frame halves further defining a plurality of tubular holes from said recesses to the outside of said cell for providing reactants and reaction products to and from the cell;

a clamping means for holding the cell together, positioned adjacent the frame back surfaces;

means for supplying electrical current to the cell and collecting electrical current from the cell.

4,520,082

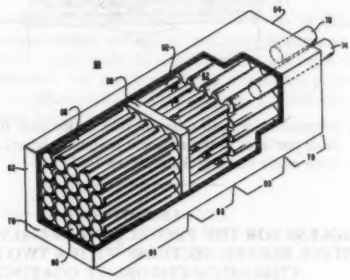
FUEL CELL GENERATOR

Joseph M. Makiel, Monroeville, Pa., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 1, 1983, Ser. No. 510,451

Int. Cl.³ H01M *8/12*

U.S. Cl. 429—26 **7 Claims**



1. A high temperature solid electrolyte fuel cell generator comprising:

a housing means defining a plurality of chambers including a generator chamber and a combustion products chamber;

a porous barrier separating said generator and combustion products chambers;

a plurality of elongated annular fuel cells each having a closed end and an open end, said open end disposed within said combustion product chamber, said cells extending from said open end through said porous barrier and into said generator chamber;

a conduit for each said cell, each said conduit extending into a portion of each said cell disposed within said generator chamber, each said conduit having means for discharging a first gaseous reactant within said fuel cell;

exhaust means, for exhausting said combustion product chamber, said exhaust means penetrating said housing means;

manifolding means for supplying said first gaseous reactant to said conduits, said manifolding means disposed within said combustion product chamber between said porous barrier and said exhaust means, said manifolding means further comprising support and bypass means for providing support of said manifolding means within said housing while allowing combustion products from said first gaseous reactant and a second reactant to flow past said manifolding means to said exhaust means; and

means for flowing said second gaseous reactant into said generator chamber.

4,520,083

NON-AQUEOUS ELECTROCHEMICAL CELL AND ELECTROLYTE

Keith B. Prater, North Vancouver, Canada; Robert J. Thrash, Carol Stream, Ill., and John F. Connolly, Glen Ellyn, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 2, 1983, Ser. No. 471,429

Int. Cl.³ H01M *4/36, 6/14, 6/04*

U.S. Cl. 429—101 **12 Claims**

1. A non-aqueous, rechargeable electrochemical cell comprising:

(a) an active metal anode;

(b) a positive electrode current collector; and

(c) an electrolyte comprising a salt of said active metal, an ionizing solvent comprising sulfur dioxide, and a supporting electrolyte salt comprising at least one component of

the general form R^+X^-, wherein R^+ is a cation different from the cation of said active metal, and X^- is an anion which forms a salt with the cation of said active metal which is less soluble in said cell than R^+X^-; wherein the saturated concentration of said active metal cation in said electrolyte is between about 10^{-9} eq/l and about 10^{-1} eq/l, and said electrolyte is substantially saturated with respect to the active metal cation, whereby an insoluble product is formed at the anode upon discharge of the cell.

4,520,084

ETCHED METAL ELECTRODES AND THEIR USE IN NONAQUEOUS ELECTROCHEMICAL CELLS

Lawrence A. Tinker, Lions Bay, and Allan C. Harkness, Vancouver, both of Canada, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Jun. 7, 1984, Ser. No. 618,244
Int. Cl.³ H01M *6/14*
U.S. Cl. 429—101 **20 Claims**

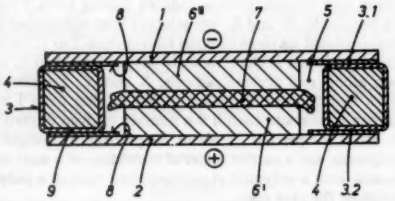
1. An electrochemical cell comprising in combination:
(a) a cathode;
(b) a nonaqueous, conductive, liquid electrolyte which comprises a cathode depolarizer; and
(c) a solid electrode comprising at least one metal selected from the group consisting of lithium, sodium, potassium and calcium, said electrode having a surface which has been modified by contact with a liquid etching agent comprising at least one alcohol selected from the group consisting of alcohols which contain up to about 30 carbon atoms.

4,520,085

GAS-TIGHT PRIMARY BATTERY

Paul-Julian Wyser, Itingen, Switzerland, assignor to Sonval S.A., Itingen, Switzerland

Filed Dec. 22, 1983, Ser. No. 564,315
Claims priority, application Switzerland, Jan. 7, 1983, 99/83
Int. Cl.³ H01M *2/08*
U.S. Cl. 429—174 **4 Claims**



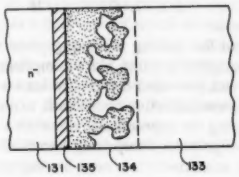
1. A gas-tight primary battery comprising one or more individual cells comprising
metallic housing elements,
negative and positive leads, wherein said leads are formed from said metallic housing elements, and
a connecting element between the outer rims of said negative and positive leads, wherein said connecting element comprises a metallic body with at least one surface adjacent to said lead comprising an inner layer of aluminum and an outer, electrically insulating, layer of aluminum oxide.

4,520,086

RECHARGEABLE SOLID POLYMER ELECTROLYTE BATTERY CELL

Terji Skotheim, East Patchoque, N.Y., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 386,666, Sep. 6, 1982, Pat. No. 4,442,185, which is a continuation-in-part of Ser. No. 312,888, Oct. 19, 1981, Pat. No. 4,416,959, which is a continuation-in-part of Ser. No. 208,059, Nov. 18, 1980, Pat. No. 4,352,868. This application Feb. 1, 1984, Ser. No. 575,731
Int. Cl.³ H01M *6/18, 6/16*
U.S. Cl. 429—192 **7 Claims**



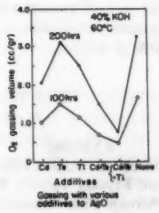
1. A rechargeable battery cell comprising a first electrode; a polymer blend of a highly conductive polymer and a solid polymer electrolyte adjacent said first electrode; a dry solid polymer electrolyte adjacent said polymer blend; and a second electrode adjacent to said dry solid polymer electrolyte.

4,520,087

DIVALENT SILVER OXIDE CELL INCLUDING CADMIUM AND TELLUNIUM

Nobuo Kamata; Takashi Sekiya; Kazutoshi Takeda; Toyoo Hayasaka, and Tomohisa Yoshida, all of Tokyo, Japan, assignors to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Continuation of Ser. No. 421,794, Sep. 23, 1982,. This application Mar. 27, 1984, Ser. No. 593,196
Claims priority, application Japan, Mar. 5, 1982, 57-34950
Int. Cl.³ H01M *4/34*
U.S. Cl. 429—219 **7 Claims**



1. A divalent silver oxide cell comprising: a negative electrode; a positive electrode comprised of an AgO mixture containing metal elements of cadmium and tellurium, the amount of said metal elements being more than 10 PPM and less than 500 PPM by weight of AgO in said AgO mixture, the amount of the cadmium element being more than 10 PPM and less than 300 PPM by weight of AgO and the amount of the tellurium element being more than 10 PPM and less than 100 PPM by weight of AgO, the AgO mixture also containing at least one component selected from the group consisting of lead, mercury, thallium, germanium, yttrium, tin, tungsten, lanthanum, a rare earth element, zinc, selenium, and aluminum, in an amount of more than 10 PPM and less than 100 PPM by weight of AgO, said positive electrode being surrounded by an Ag_2O layer which is free of metallic elements, and a silver layer on at least a part of the outer surface of the Ag_2O layer; a separator

between said negative electrode and said positive electrode; and an electrolyte.

4,520,088

METHOD FOR MAKING PRINTING PLATES

Takao Senga; Jun Yamada, and Shigeyoshi Suzuki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jan. 11, 1983, Ser. No. 457,281

Claims priority, application Japan, Jan. 14, 1982, 57-4157; Jan. 26, 1982, 57-10325; Feb. 13, 1982, 57-21824

Int. Cl.³ G03G *13/28*

U.S. Cl. 430—49 **15 Claims**

1. A method for making a printing plate which comprises charging an original printing plate comprising an electroconductive base and, provided thereon, at least a layer containing an organic photoconductive compound, exposing the charged plate, developing the exposed element with a liquid developer containing a copolymer comprising 5 to 60% by weight of an acrylate ester or methacrylate ester having an alkyl group of 4 or more carbon atoms, 30 to 90% by weight of a styrene or a styrene derivative and 5 to 40% by weight of an acrylate ester or a methacrylate ester having an alkyl group of 3 or less carbon atoms to form a toner image, fixing the toner image and removing the layer of the non-image areas by etching it with an alkaline etching solution.

4,520,089

ELECTROPHOTOGRAPHIC OFFSET MASTERS

Shoji Tazuki, and Koji Toyama, both of Tokyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,814

Claims priority, application Japan, Sep. 21, 1982, 57-164282

Int. Cl.³ G03G *5/10*

U.S. Cl. 430—49 **7 Claims**

1. Electrophotographic offset master which comprises a support and at least a back coat layer, a precoat layer and a photoconductive layer on said support wherein said back coat layer contains as pigment component, sericite or a pigment containing at least 30% of sericite.

4,520,090

MAGNETIC TONER

Hiroshi Yamazaki, and Kiyoshi Tamaki, both of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

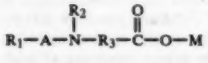
Filed May 31, 1983, Ser. No. 499,185

Claims priority, application Japan, Jun. 2, 1982, 57-93056

Int. Cl.³ G03G *9/14*

U.S. Cl. 430—106.6 **19 Claims**

1. A magnetic toner which comprises a magnetic toner powder, a binder and a compound having the formula:



General formula I

wherein R_1 represents an alkyl group or an alkenyl group each having 4 to 30 carbon atoms; R_2 represents a hydrogen atom or a methyl group; R_3 represents an alkylene group having 1 to 4 carbon atoms; A represents a carbonyl group or a sulfonyl group; and M represents a hydrogen atom, an alkali metal, an alkali earth metal or an amine.

4,520,091

ENCAPSULATED ELECTROSTATOGRAPHIC TONER MATERIAL

Fujio Kukimi, and Takeshi Mikami, both of Fujinomiya, Japan, assignors to Fuji Photo Film Co., Ltd., Tokyo, Japan

Filed Mar. 23, 1984, Ser. No. 592,863

Claims priority, application Japan, Mar. 23, 1983, 58-48419

Int. Cl.³ G03G *9/08*

U.S. Cl. 430—110 **6 Claims**

1. An encapsulated electrostatographic toner material comprising a core and a shell enclosing the core, in which said core comprises a colorant, a polymer, a solvent having a boiling point of not lower than 180° C. which is capable of dissolving the polymer or causing the polymer to swell, and an organic liquid having a boiling point in the range of 100° to 250° C. which is substantially incapable of dissolving the polymer or causing the polymer to swell.

4,520,092

PROCESS FOR PREVENTING DEPOSITION OF TONER PARTICLES IN AN IMAGING APPARATUS

John F. Knapp, Fairport, and Robert J. Gruber, Pittsford, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 219,674, Dec. 24, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 566,754

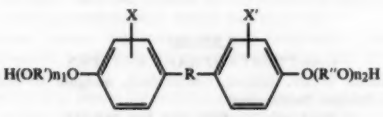
Int. Cl.³ G03G *13/09*

U.S. Cl. 430—120 **7 Claims**

1. A process for obtaining smudge resistant images and for preventing the deposition of unwanted toner particles in an imaging apparatus consisting essentially of

(a) providing a xerographic imaging apparatus,

(b) adding an improved two component contamination free developer composition to said apparatus, which composition consists essentially of from about 50 percent to about 80 percent by weight of a resin comprised of the polymeric esterification product of a dicarboxylic acid and a diol comprising a diphenol of the following formula



wherein R is selected from substituted and unsubstituted alkylene radicals having from about 2 to about 12 carbon atoms, alkylidene radicals having from 1 to 12 carbon atoms and cycloalkylidene radicals having from 3 to 12 carbon atoms; R′ and R″ are selected from substituted and unsubstituted alkylene radicals having from 2 to 12 carbon atoms, alkylene arylene radicals having from 8 to 12 carbon atoms and arylene radicals; X and X′; are selected from hydrogen or any alkyl radical having from 1 to 4 carbon atoms; and each n is a number of from 0 (zero) to 4, about 20 percent to about 50 percent by weight of magnetite and a carrier material consisting of a steel core coated with a polymethyl methacrylate resin or a polyvinylidene fluoride resin,

(c) forming electrostatic latent images in the imaging apparatus, and

(d) developing the images formed.

4,520,093

PHOTOSENSITIVE COMPOSITION AND METHOD FOR FORMING A NEUTRAL BLACK IMAGE

William J. Chambers, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jan. 30, 1984, Ser. No. 575,062

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—292 **19 Claims**

1. In a photosensitive element for photoimaging applications

comprising a substrate coated with a photosensitive layer containing dispersed silver halide particles in operative association with a continuous film-forming phase of polymeric coupler, the coupler characterized by a number average molecular weight of about 2,000 to 100,000, a content of about 10 to 100 milliequivalents of coupler groups per 100 g of polymeric coupler and about 15 to 175 milliequivalents per 100 g of polymeric coupler of at least one acid group selected from carboxylic, sulfonic, and phosphonic, and the ability to couple with an oxidized p-aminodialkylaniline to become insoluble in aqueous solvents;

the improvement which comprises said photosensitive element having compensating pigments dispersed therein, as well as silver halide, the pigments being of selected colors and concentrations to effect, upon photosensitization, a neutral black image characterized by an optical density imbalance of no more than about 0.5 and an optical density of at least about 2.0; the silver halide being sensitized to absorb radiation in the wave length region corresponding to that where the principal compensating pigment transmits radiation.

4,520,094

PROCESS FOR FORMING POWDER PATTERN ON LIGHT EXPOSED LAYER HAVING PHOTOSENSITIVE DIAZONIUM SALTS

Hajime Morishita; Motoo Akagi, both of Tokyo; Nobuaki Hayashi, Saitama; Saburo Nonogaki, Tokyo; Shoichi Uchino, Hachioji, and Takahiro Kohashi, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 19, 1982, Ser. No. 435,272

Claims priority, application Japan, Oct. 21, 1981, 56-167211

Int. Cl.³ G03C *5/34, 5/18*

U.S. Cl. 430—144 **4 Claims**

1. A process for forming a pattern of powder on a coating layer, which comprises a step of applying a photosensitive composition comprising a 4-(dimethylamino)benzenediazonium salt and at least one salt of o- and m-aminobenzenediazonium compounds selected from the group consisting of 4-alkoxy-5-(dimethylamino)benzenediazonium salt, 4-alkyl-5-(dimethylamino)benzenediazonium salt, 3-alkoxy-6-(dimethylamino)benzenediazonium salt, 4-alkoxy-6-(dimethylamino)benzenediazonium salt and 4-alkyl-5-(methylamino)benzenediazonium salt wherein the carbon atom number in alkyl groups and alkoxy groups in said salts is 2 or less, said composition containing 1–200% by weight of at least one of the salts of the o- and m-aminobenzenediazonium compounds on the basis of the 4-(dimethylamino)benzenediazonium salt, to a substrate thereby forming a thin layer, a step of subjecting the thin layer to patternwise light exposure to make the exposed portions of the layer sticky, and a step of contacting the light-exposed thin layer with powder particles, thereby depositing the powder particles to light-exposed portions of said thin layer.

4,520,095

PHOTOGRAPHIC LIGHT-SENSITIVE ELEMENT

Tatsuhiko Kobayashi; Satoru Ikeuchi; Kazumasa Watanabe, and Shunji Suginaka, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

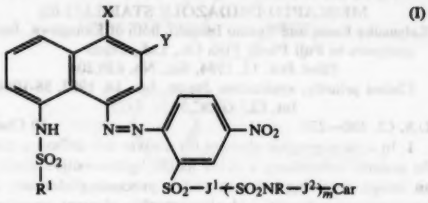
Filed Oct. 4, 1983, Ser. No. 538,798

Claims priority, application Japan, Oct. 12, 1982, 57-179237

Int. Cl.³ G03C *1/40, 5/54*

U.S. Cl. 430—223 **41 Claims**

1. A photographic light-sensitive element comprising a support having thereon at least one light-sensitive silver halide emulsion layer and a dye image forming non-diffusible material which releases a diffusible cyan dye or the precursor thereof wherein said dye image forming material is a compound of Formula I:



(I)

wherein Car represents a carrier component having at least one Ball ballasting group as a part thereof which alone or together with other such groups in said Car renders said compound non-diffusible during development in an alkaline processing solution, said Car being capable of releasing from said compound a diffusible dye or the precursor thereof as the result of a redox reaction under alkaline conditions;

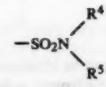
R represents a hydrogen atom or an alkyl group having from 1 to 3 carbon atoms;

R^1 is

wherein R^2 and R^3 are independently selected from a hydrogen atom, or an alkyl having from 1 to 3 carbon atoms, a cycloalkyl or an aryl group, and R^2 and R^3 may be linked through an oxygen atom or nitrogen atom to each other to form a 5-membered or 6-membered ring;

X is hydroxyl group or a salt thereof or a group which can be hydrolyzed to a hydroxyl group;

Y is



wherein R^4 is selected from the group consisting of acyl, hydroxyalkyl, alkoxyalkyl, alkoxyalkyleneoxyalkyl, carboxyalkyl, carboxyphenyl, carboxyalkyl-phenyl, hydroxyalkyl-phenyl, and alkoxyphenyl group;

R^5 is selected from the group consisting of hydrogen, alkyl or aryl having from 1 to 8 carbon atoms, and the same group R^4 is selected from, provided the sum of the number of carbon atoms contained in R^4 and R^5 is not more than 10;

m is an integer of 0 or 1; and

J^1 and J^2 are independently selected from divalent groups having the formula; $—R^6—(O)_n—R_p^7—$ wherein R^6 and R^7 are independently selected from alkylene having from 1 to 8 carbon atoms, phenylene and phenylene substituted by a chlorine atom, a methoxy group, or a methyl group; n is an integer of 0 or 1; p is 1 when n is 1, and p is 1 or 2 when n is 0, provided that when p is 1, the sum of the number of the carbon atoms contained in R^6 and R^7 is not more than 13.

31. A photographic film unit comprising:

(a) said photographic light-sensitive element of claim 1;

(b) a dye image receiving layer; and

(c) means to squeeze out said alkaline processing composition inside said film unit.

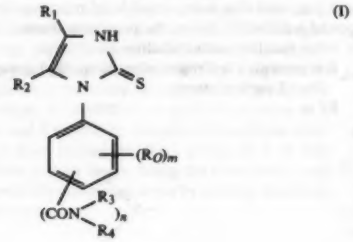
4,520,096

PHOTOGRAPHIC ELEMENTS FOR SILVER SALT DIFFUSION TRANSFER PROCESS CONTAINING MERCAPTO IMIDAZOLE STABILIZERS

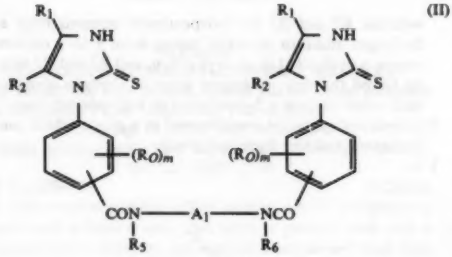
Katsusuke Endo, and Yoshio Inagaki, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Jun. 13, 1984, Ser. No. 620,204
Claims priority, application Japan, Jun. 14, 1983, 58-106464
Int. Cl.³ G03C 5/54, 1/35
U.S. Cl. 430—233 20 Claims

1. In a photographic element for a silver salt diffusion transfer process comprising a silver halide light-sensitive element, an image receiving element and a processing element, the improvement wherein said photographic element contains a compound represented by formula (I) or (II)



(I)



(II)

wherein the R_Os, which may be identical or different from one another, each represents hydrogen, a halogen atom, an alkyl group, a substituted alkyl group, a substituted or unsubstituted cycloalkyl group, an alkoxy group, a substituted alkoxy group, a substituted or unsubstituted alkylsulfonyl group, a substituted or unsubstituted arylsulfonyl group, a sulfamoyl group, an alkyl or arylsulfonamido group, a carbamoyl group, a carbonamido group, a heterocyclic group, a substituted or unsubstituted aryl group, an acyl group, a substituted or unsubstituted alkoxycarbonyl group, a substituted or unsubstituted acyloxy group, a substituted or unsubstituted alkylthio group, a substituted or unsubstituted arylthio group, a primary amino group or the salt thereof, a secondary or tertiary amino group substituted by alkyl groups or aryl groups or the salt thereof, a nitro group, a hydroxyl group, a carboxyl group, a sulfonic acid group or a cyano group; R_1 and R_2 each represents hydrogen, an alkyl group, a substituted alkyl group or an aryl group; R_3 and R_4 each represents hydrogen, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or a heterocyclic group; R_3 and R_4 may form a 5- or 6-membered ring together with the nitrogen atom, wherein the ring may further contain hetero atoms; R_5 and R_6 each represents hydrogen, an alkyl group, a substituted alkyl group, an aryl group, a substituted aryl group or a heterocyclic group; A_1 represents a divalent group; m represents an integer of 1 to 4; and n represents 1 or 2.

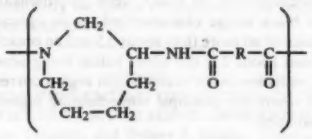
4,520,097

NEGATIVE-TYPE RESIST SENSITIVE TO IONIZING RADIATION

Kiyoshi Oguchi, 252-2, Mizuno, Sayama-Shi, Saitama-Ken, Japan

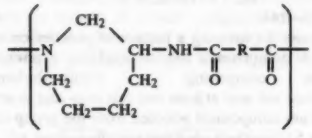
Filed Oct. 4, 1982, Ser. No. 432,448
Claims priority, application Japan, Oct. 9, 1981, 56-161431
Int. Cl.³ G03C 1/71, 1/70
U.S. Cl. 430—280 5 Claims

1. A negative-type resist solution, which comprises (i) a polyamide polymer sensitive to ionizing radiation, said polyamide polymer having a molecular weight of from 10,000 to 1,000,000 and having recurring units represented by the formula:



wherein R represents at least one divalent organic group selected from the group consisting of olefinic hydrocarbon groups, divalent heterocyclic groups, and epoxidized hydrocarbon groups, and (ii) a solvent, wherein the concentration of said polyamide polymer in said resist solution is from 5 to 15 weight %.

3. A negative-type resist sensitive to ionizing radiation, which comprises a mixture of a polyamide polymer having the recurring units represented by the formula:



wherein R represents at least one divalent organic group with another polymer compatable therewith.

4. A negative-type resist solution according to claim 3, wherein said another polymer is an epoxidized aliphatic polyamide.

4,520,098

PHOTOGRAPHIC ELEMENT EXHIBITING REDUCED SENSITIZING DYE STAIN

Robert E. Dickerson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 31, 1984, Ser. No. 615,631
Int. Cl.³ G03C 1/00, 1/02
U.S. Cl. 430—495 16 Claims

1. In a photographic element capable of producing a stable, viewable silver image on development in an aqueous alkaline processing solution and fixing out comprising

a support and

one or more image recording silver halide emulsion layers each comprised of a dispersing medium and latent image forming silver halide grains, said halide consisting essentially of chloride, bromide, or mixtures thereof,

at least one of said image recording silver halide emulsion layers being comprised of spectral sensitizing dye adsorbed to the surface of tabular latent image forming silver halide grains having a thickness of less than 0.5 μm and an average aspect ratio of at least 5:1 accounting for at least 35 percent of the total projected area of said latent image forming silver halide grains present in said silver halide emulsion layer,

the improvement comprising high iodide silver halide grains of less than 0.25 μm in mean diameter located in proximity to said tabular silver halide grains and limited to a concentration capable of being dissolved on fixing out.

4,520,099

SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Yoshitaka Akimura; Hiroyuki Mifune, and Koki Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

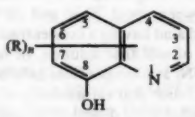
Filed Sep. 2, 1983, Ser. No. 528,928
Claims priority, application Japan, Sep. 2, 1982, 57-152913
Int. Cl.³ G03C *1/34*
U.S. Cl. 430—613 **16 Claims**

1. A silver halide photographic light-sensitive material, comprising:

a support having positioned thereon;

a silver halide emulsion layer; and

a compound represented by the general formula (I):



(I)

wherein R is a halogen atom or an alkyl group and an n is 1, 2 or 3 and when n is 2 or 3 each R may be the same or different, said compound is present in an amount sufficient to restrain fog.

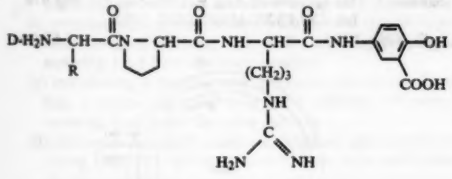
4,520,100

METHOD FOR MEASURING THROMBIN

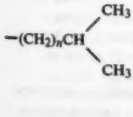
Takeshi Nagasawa; Katsumasa Kuroiwa, and Katsuyuki Takabayashi, all of Koriyama, Japan, assignors to Nitto Boseki Co. Ltd., Fukushima, Japan

Division of Ser. No. 406,025, Aug. 6, 1982, Pat. No. 4,450,105.
This application Feb. 10, 1984, Ser. No. 578,805
Claims priority, application Japan, Sep. 28, 1981, 56-153472
Int. Cl.³ C12Q *1/56, 1/38*
U.S. Cl. 435—13 **1 Claim**

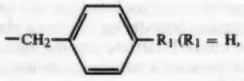
1. A method for measuring the activity of thrombin in plasma which comprises (a) reacting a compound of the following formula or a salt thereof



wherein R represents



(n = 0,1 or 2),



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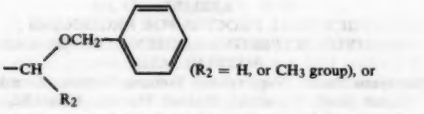
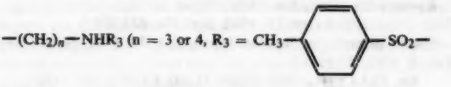
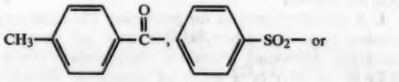
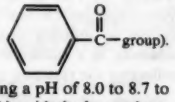








with thrombin in a buffer solution having a pH of 8.0 to 8.7 to produce 3-carboxy-4-hydroxyaniline, (b) oxidatively condensing said aniline with a coupler to form a colored compound and (c) quantitatively determining said colored compound by colorimetry or fluorometry.

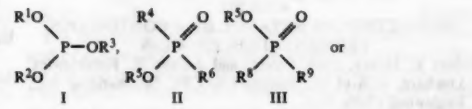
4,520,101

PRODUCTION OF CEPHALOSPORIN C

David A. Lowe, Jamesville; Guna Romancik, Syracuse; Leonardo M. Cappelletti, Fayetteville, and Richard P. Elander, Manlius, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Mar. 7, 1983, Ser. No. 472,444
Int. Cl.³ C12P *35/06;* C12N *9/18*
U.S. Cl. 435—49 **15 Claims**

1. In a method for producing cephalosprin C by culturing a cephalosporin C-producing microorganism which also produces desacetylcephalosporin C in a nutrient medium, the improvement which comprises adding to said medium a phosphorous compound of the formula



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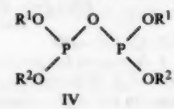


IV

wherein R^1, R^2 and R^3 each independently represent straight or branched chain C_1–C_{10} alkyl, phenyl or phenyl(C_1–C_4)-alkyl, said alkyl group or the alkyl portion of phenylalkyl being optionally substituted by one or more halo or carboxy substituents and said phenyl group or the phenyl portion of phenylalkyl being optionally substituted by one or more C_1–C_6 alkyl, C_1–C_6 alkoxy or halo substituents; R^4 is C_1–C_6 alkyl optionally substituted by one or more halo groups or is —OR^{10} in which R^{10} is hydrogen or is as defined above for R^1; R^5 is hydrogen or is as defined above for R^1; R^6 is hydrogen, C_2–C_6 alkenyl,

C_2–C_6 alkanoyl or C_1–C_6 alkyl, said alkyl group being optionally substituted by one or more cyano, C_2–C_6 alkanoyl or carbo (C_1–C_6) alkoxy radicals; and R^8 and R^9 are either both hydrogen or are both chloro, in a concentration of from about 100 to 3000 parts per million.

4,520,102

MICROBIAL PROCESS FOR PRODUCING 12α-HYDROXYPREGNA-1,4-DIEN-3-ONE-20α-CARBOXYLIC ACID

Masayasu Bunno, Nagareyama; Tsutomu Sugiura, Kurashiki; Masao Tsuji, Kurashiki; Hidemi Harada, Kurashiki, and Yoshihiro Ichihara, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 15, 1982, Ser. No. 434,560

Claims priority, application Japan, Oct. 20, 1981, 56-168276; Feb. 5, 1982, 57-17866

Int. Cl.³ C12P *33/02;* **C12N** *15/00;* **C12R** *1/05, 1/38*

U.S. Cl. 435—61 **4 Claims**

1. A microbial process for producing 12α-hydroxypregna-1,4-dien-3-one-20α-carboxylic acid or a salt thereof, which comprises cultivating a strain of *Pseudomonas arvilla* D-235 (FERM BP-181) or a strain of *Alcaligines faecalis* D4040 (FERM BP-182) or its mutant, capable of producing 12α-hydroxypregna-1,4-dien-3-one-20α-carboxylic acid or a salt thereof by utilizing deoxycholic acid or a salt thereof as a substrate, in a culture medium containing said substrate, and collecting the resulting compound.

4,520,103

MICROBIAL PRODUCTION OF INDIGO

Burt D. Ensley, Jr., Thousand Oaks, Calif., assignor to Amgen, Thousand Oaks, Calif.

Filed Oct. 27, 1982, Ser. No. 437,035

Int. Cl.³ C12N *15/00, 1/20, 1/00;* **C12P** *17/10*

U.S. Cl. 435—121 **14 Claims**

1. A process for microbial production of indigo in a selected microorganism having the metabolic capacity to produce and accumulate indole, said process comprising:

(1) stably genetically transforming the microorganism with an exogenous DNA sequence to incorporate the capacity to synthesize an aromatic dioxygenase enzyme capable of participating in the formation of indigo from indole;

(2) growing transformed microorganisms under conditions facilitative of dioxygenase enzyme catalyzed oxidative transformation of indole; and

(3) isolating indigo produced by said microorganisms.

4,520,104

PRODUCTION OF BUTANOL BY A CONTINUOUS FERMENTATION PROCESS

Robert E. Heady, Park Forest, and Jeffrey R. Frankiewicz, Lombard, both of Ill., assignors to CPC International Inc., Englewood Cliffs, N.J.

Filed Nov. 18, 1982, Ser. No. 442,806

Int. Cl.³ C12P *7/16*

U.S. Cl. 435—160 **9 Claims**

1. A process for producing butanol by continuous fermentation of a carbohydrate with a strain of *C. acetobutylicum* wherein the improvement comprises:

continuously in a separate reactor producing inoculum of said strain at a dilution rate that minimizes butanol contact with said inoculum;

continuously supplying said inoculum to the fermentation medium;

continuously cycling a portion of the fermentation medium through a butanol-adsorbing material at a rate sufficient to maintain a less than about 1% by weight butanol concentration in the fermentation medium; and

isolating the butanol by desorbing it from the butanol-adsorbing material.

4,520,105

PROCESS FOR PRODUCTION OF SUGARS AND OPTIONALLY CELLULOSE AND LIGNIN FROM LIGNOCELLULOSIC RAW MATERIALS

Michael Sinner, Dassendorf; Hans-Hermann Dietrichs, Reinbek; Jürgen Puls, Pinneberg; Werner Schweers, Reinbek, and Karl-Heinz Brachthäuser, Ratingen, all of Fed. Rep. of Germany, assignors to Bau- und Forschungsgesellschaft Thermoform AG, Murten/Fribourg, Switzerland

Continuation of Ser. No. 257,256, Apr. 24, 1981, abandoned, which is a continuation of Ser. No. 116,207, Jan. 28, 1980, abandoned, which is a continuation of Ser. No. 933,623, Aug. 14, 1978, abandoned. This application Aug. 10, 1983, Ser. No. 521,657

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1977, 2737118

Int. Cl.³ D21C *3/20;* **C13K** *1/02*

U.S. Cl. 435—163 **11 Claims**

1. A process for treating vegetable material essentially comprised of cellulose, lignin and hemicelluloses, comprising the steps of:

(a) treating said vegetable material under elevated pressure with a first solution comprising (i) water and acetone in a volume ratio between about 70:30 and 30:70, and (ii) at least one acid, said acid having a concentration, relative to the total volume of said first solution, of between about 0.001 and about 1N, at a temperature between about 170° and about 220° C., such that substantially all of said lignin and said hemicelluloses are dissolved in said first solution and a residue comprising microcrystalline cellulose is formed;

(b) separating said residue from said first solution; and

(c) after step (b), treating said residue with a second solution comprising (i) water and acetone in a volume ratio between about 70:30 and 30:70, and (ii) at least one acid, said acid having a concentration, relative to the total volume of said first solution, of between about 0.001 and about 1N, at a temperature between about 170° and about 220° C., such that said microcrystalline cellulose is substantially completely hydrolyzed to glucose, said glucose being dissolved in said second solution.

4,520,106

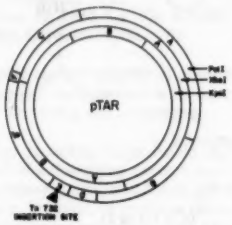
TARTRATE CATABOLISM GENE

Clarence I. Kado, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 221,114, Dec. 29, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 405,976

Int. Cl.³ C12N *15/00, 1/20, 1/00*

U.S. Cl. 435—172.3 **3 Claims**



1. A method for making an incompetent unicellular microorganism host competent to utilize L-tartrate as a carbon source, said method comprising introducing in vitro a plasmid conferring the ability to utilize L-tartrate into the host, said plasmid being capable of expressing a tartrate catabolism gene derived from plasmid pTAR.

4,520,107

TISSUE CULTURE AND CELL GROWTH-PROMOTING MATERIAL AND ITS METHOD OF MANUFACTURE

George M. Healy, Scarborough, and Kenneth D. Curry, Toronto, both of Canada, assignors to Polydex Chemicals Ltd., Nassau, The Bahamas

Filed Sep. 28, 1982, Ser. No. 424,862
Int. Cl.³ C12N 5/00, 1/38; A61K 35/14; C07G 7/00
U.S. Cl. 435—240 15 Claims

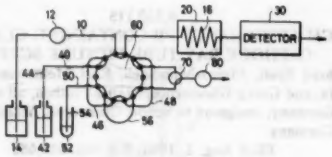
1. A process for the production of a growth promoting supplement for tissue culture media providing improved cell and tissue growth which comprises comminuting bovine blood clot with cutting means having smoothly rounded edges to minimize disruption of red blood cells in the presence of a buffered aqueous saline solution to form a suspension of comminuted blood clot in said saline solution, allowing the resulting suspension to become thoroughly infused to allow clot occluded blood serum and clot intrinsic blood factors to pass into said saline solution, and separating said saline solution containing said growth promoting material from said suspension to provide said growth promoting supplement in saline solution.

4,520,108

METHOD FOR CONTINUOUS FLOW ANALYSIS OF LIQUID SAMPLE

Kasumi Yoshida, Mito; Hideo Uchiki, and Tadafumi Kuroishi, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 18, 1982, Ser. No. 442,671
Claims priority, application Japan, Nov. 20, 1981, 56-185326
Int. Cl.³ G01N 1/18, 35/00
U.S. Cl. 436—52 10 Claims



1. A method of flow analysis of a liquid sample, which comprises the steps of:

(a) forming a stream of a carrier liquid in a main conduit which leads towards a detection zone;

(b) introducing a predetermined volume of a reagent liquid into a reagent metering loop while isolating the reagent metering loop from the main conduit;

(c) introducing a predetermined volume of a sample liquid into a sample metering loop while isolating the sample metering loop from the main conduit;

(d) placing said reagent metering loop and said sample metering loop in a series communication with each other, thereby contacting the sample liquid in the sample metering loop with the reagent liquid in the reagent metering loop;

(e) simultaneously with step (d) diverting the stream of the carrier liquid from a portion of said main stream upstream of the detection zone to inject the stream of carrier liquid in series flow through the reagent metering loop and the sample metering loop while keeping the sample liquid and the reagent liquid in contact with each other thereby displacing the reagent liquid and the sample liquid from said metering loops into the main conduit leading to the detection zone; and

(f) measuring a reaction solution brought into the detection zone to detect the sample by the reaction conditions in said detection zone.

4,520,109

FLUOROCARBON TRACERS AND TRACING METHOD

Peter G. Simmonds, Ringwood, England, and Robert E. Moore, Wilmington, Del., assignors to Sun Tech, Inc., Philadelphia, Pa.

Filed Mar. 14, 1983, Ser. No. 475,001
Int. Cl.³ G01N 33/28, 31/08
U.S. Cl. 436—56 10 Claims

1. A tracing method comprising the steps of (1) incorporating a tracer compound into a material or a fluid medium in order to identify the source or distribution of the material or to define the flow pattern of the medium, (2) permitting distribution of the material or flow of the fluid medium, (3) collecting a sample of the material or fluid medium, and (4) analyzing the sample for the presence of the tracer compound, wherein said tracer compound is a perfluorinated C_9–C_{18} polycyclic hydrocarbon containing at least two bridgehead carbon atoms linked through a bridge containing at least one carbon atom.

4,520,110

FLUORESCENT IMMUNOASSAY EMPLOYING A PHYCOBILIPROTEIN LABELED LIGAND OR RECEPTOR

Lubert Stryer, Stanford; Alexander N. Glazer, Orinda, and Vernon T. Oi, Palo Alto, all of Calif., assignors to The Board of Trustees of the Leland Stanford Junior University, Stanford, Calif.

Continuation-in-part of Ser. No. 309,169, Oct. 6, 1981, abandoned. This application Dec. 30, 1982, Ser. No. 454,768
Int. Cl.³ G01N 33/54, 31/00
U.S. Cl. 436—501 4 Claims

1. In a fluorescent immunoassay employing as a reagent a fluorescent compound conjugated to a member of a specific binding pair where said pair consists of ligand and receptor, and said immunoassay is for the determination of a member, the binding of the conjugate to a member being indicative of the presence of said member, the improvement which comprises employing in said assay a fluorescent compound comprising a phycobiliprotein conjugated to a member of a specific binding pair consisting of ligand and receptor.

4,520,111

DIAGNOSTIC METHOD FOR DETERMINING CONTENT OF SIALIC ACID OR SIALOPROTEIN

Ronald L. Miller, Charleston, S.C., assignor to Research Corporation, New York, N.Y.

Division of Ser. No. 355,378, Mar. 8, 1982, Pat. No. 4,457,865. This application Jan. 26, 1984, Ser. No. 574,235
Int. Cl.³ G01N 1/00, 33/48; C07G 7/00
U.S. Cl. 436—501 6 Claims

1. A diagnostic method for determining the content of sialic acid or sialoprotein in a biological liquid comprising contacting the said biological liquid with a predetermined quantity of a substantially homogeneous lectin of the slug Limax flavus having a high degree of hemagglutinative inhibitory specificity and selectivity for sialic acid or sialoprotein having an approximate amino acid composition:

Amino Acid	Moles per 22,000 g of Lectin (Nearest integer)
Asx	26
Thr	13
Ser	13
Glx	14
Pro	4
Gly	22
Ala	16
Val	7
Met	2
Ile	7
Leu	15
Tyr	10
Phe	10

-continued

Amino Acid	Moles per 22,000 g of Lectin (Nearest integer)
His	7
Lys	17
Trp	6
Arg	8
Cys	6

and measuring the degree of hemagglutination effected by said lectin and comparing said measurement with the degree of hemagglutination effected with contacting an identical quantity of said lectin with a similar biological fluid containing a known amount of sialic acid or sialoprotein.

4,520,112

ASSAY METHOD FOR ORGANIC CALCIUM ANTAGONIST DRUGS AND A KIT FOR SUCH AN ASSAY

Solomon H. Snyder, and Robert J. Gould, both of Baltimore, Md., assignors to The Johns Hopkins University, Baltimore, Md.

Filed Mar. 9, 1983, Ser. No. 473,622
Int. Cl.³ G01N *33/60*; G01T *1/00*
U.S. Cl. 436—504 **16 Claims**

1. A method for measuring the level of an organic calcium antagonist drug including a pharmacologically active metabolite thereof in a body fluid comprising

(a) preparing a mixture of a radioactive calcium antagonist drug, a body fluid containing a calcium antagonist drug and a calcium antagonist receptor material having receptor sites whereby said calcium antagonist drug competes with the binding of said radioactive calcium antagonist drug to said receptor sites,

(b) measuring the radioactivity of the radioactive calcium antagonist drug bound to said calcium antagonist receptor material, and

(c) deriving the concentration of the calcium antagonist drug in said body fluid from a standard curve indicating the concentration of calcium antagonist drug versus inhibition of binding of said radioactive calcium antagonist drug to said receptor sites caused by the calcium antagonist drug in said body fluid.

4,520,113

SEROLOGICAL DETECTION OF ANTIBODIES TO HTLV-III IN SERA OF PATIENTS WITH AIDS AND PRE-AIDS CONDITIONS

Robert C. Gallo; Mikulas Popovic, both of Bethesda, Md., and Mangalasseril G. Sarngadharan, Vienna, Va., assignors to The United States of America as represented by the Secretary of the Department of Health and Human Services, Washington, D.C.

Filed Apr. 23, 1984, Ser. No. 602,945
Int. Cl.³ G01N *33/54, 33/56*
U.S. Cl. 436—504 **10 Claims**

1. A method for the detection of antibodies which specifically bind to antigenic sites of the Human T-cell Leukemia Virus-III (HTLV-III) virion in samples of the body fluids of patients with Acquired Immune Deficiency Syndrome (AIDS) or risk of AIDS (pre-AIDS) which comprises contacting HTLV-III or fractions thereof said sample with antibodies from human sera taken from AIDS patients and measuring the formation of antigen-antibody complexes by strip radioimmunoassay based on Western Blot technique or ELISA (an enzyme-linked immunosorbent assay) or indirect immunofluorescent assay.

4,520,114

PRODUCTION OF METASTABLE TETRAGONAL ZIRCONIA

Lawrence D. David, Wappingers Falls, N.Y., assignor to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 536,065, Sep. 26, 1983, abandoned. This application Aug. 22, 1984, Ser. No. 642,702
Int. Cl.³ C04B *35/48*
U.S. Cl. 501—12 **17 Claims**

1. A process for the production of fine grain metastable tetragonal zirconia which comprises (1) preparing a homogeneous solution by dissolving in a solvent medium zirconium β-diketonate and a metastabilizing quantity of metal β-diketonate selected from alkaline earth and yttrium metal β-diketonates, (2) removing the solvent medium to provide a residual mass of precursor solids, (3) pyrolyzing the precursor solids in an inert atmosphere at a temperature between about 300°–800° C. until the precursor solids have a carbon content between about 1–10 weight percent, based on the weight of precursor solids, and (4) calcining the precursor solids in the presence of molecular oxygen at a temperature between about 300°–800° C. to yield metastable tetragonal zirconia powder having an average particle size less than about 1000 angstroms.

10. A metastable tetragonal zirconia powder with a crystal structure which is a solid solution of zirconium dioxide and a metastabilizing quantity between about 1–30 mole percent of metal oxide selected from alkaline earth and yttrium metal oxides, and further characterized by:

(a) a crystallite size up to about 500 angstroms;

(b) an average particle size less than about 1000 angstroms;

(c) particles of equiaxed dimensions; and

(d) is substantially free of monoclinic and cubic phase crystal structures as determined by X-ray diffraction pattern analysis.

4,520,115

HIGH ABSORBANCE PB-CONTAINING GLASS FOR CATHODE RAY TUBE PICTURE SCREEN

Burkhard Speit, Mainz-Mombach; Karl Mennemann, Taunusstein, and Georg Gliemeroth, Mainz-Finthen, all of Fed. Rep. of Germany, assignors to Schott Glaswerke, Mainz, Fed. Rep. of Germany

Filed Aug. 2, 1983, Ser. No. 519,650
Claims priority, application Fed. Rep. of Germany, Aug. 2, 1982, 3228826
Int. Cl.³ C03C *3/10*
U.S. Cl. 501—60 **14 Claims**

1. A highly absorbent lead-containing alkali metal silicate glass useful for cathode ray tube image screens, having a linear X-ray absorption coefficient μ of $>30\ cm^{-1}$ (0.6Å), and a high resistance to discoloration by X-ray and electron radiation, consisting essentially of, in weight percent:

SiO_2	30–60%	
$P_2O_5 + B_2O_3 + Al_2O_3$	0–15%	
Li_2O	0–5%	
Na_2O	1–2.9%	5–10.8%
K_2O	4–8.5%	
$MgO + CaO + ZnO$	0–8%	
$SrO + BaO$	0–40%	20–60%
PbO	5–50%	
ZrO_2	0–8%	
CeO_2	1.0–3.5%	
and 0–20% in total of		
$La_2O_3 + Y_2O_3 + Bi_2O_3 + SnO$	0–15%	
$S + Se + Te$	0–5%	
$F + Cl + Br + SO_4$	0–3%	
TiO_2	0–5%	
rare earth metal oxides atomic numbers 58–91	0–3%	
$Fe_2O_3 + Cr_2O_3 +$	0–1%	

-continued

MnO + NiO + CoO	
$As_2O_3 + Sb_2O_3$	0–2%.

4,520,116

TRANSPARENT ALUMINUM OXYNITRIDE AND METHOD OF MANUFACTURE

Richard L. Gentilman, Acton; Edward A. Maguire, Ashland, and Leonard E. Dolhert, Malden, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 297,896, Aug. 31, 1981, abandoned. This application Jan. 13, 1984, Ser. No. 570,419

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—98 9 Claims

1. A body of polycrystalline cubic aluminum oxynitride having a density greater than 97.2% of theoretical density, a sample of said body having an in-line transmission of at least 20% in the wavelength range of 0.3–5 microns said sample having a thickness of 1.90 millimeters.

7. A body of polycrystalline doped cubic aluminum oxynitride having a density greater than 99% of theoretical density.

4,520,117

REFRACTORY ARTICLES AND THE METHOD FOR THE MANUFACTURE THEREOF

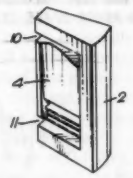
David Mills; Alan D. Kington, and Philip J. Lovell, all of Bristol, England, assignors to Rolls-Royce Limited, England

Filed Mar. 23, 1982, Ser. No. 360,952

Claims priority, application United Kingdom, Apr. 9, 1981, 8111223

Int. Cl.³ C04B *39/08*

U.S. Cl. 501—107 37 Claims



1. A method for producing a refractory article comprising:

filling at least one die with a refractory material consisting essentially of a refractory material selected from the group consisting of silica, alumina zircon and zirconium silicate;

forming a plurality of pre-forms having a shape corresponding to said at least one die;

curing the refractory material mixture pre-forms into their green state;

removing the green pre-forms from said at least one die;

assembling a plurality of the green pre-forms loosely in a closely-packed array resulting in contacting engagement between peripheral surfaces of adjacently located green pre-forms;

circumferentially clamping the array of pre-forms tightly together with one or more bands of flexible high temperature material, which shrinks on heating to a greater extent than the green refractory pre-forms, such that the pre-forms are provided with at least a limited degree of relative movement during firing to accomodate deformations in the pre-forms during firing;

firing the circumferentially clamped assembly of pre-forms such that the peripheral surfaces of adjacently located pre-forms achieve substantial contact therebetween and remain in substantial contact due only to peripheral confining pressure upon the assembly of pre-forms, without any sintering occurring between individual pre-forms, resulting from the relative greater shrinkage of the high temperature material.

4,520,118

CATALYTIC ACTIVITY OF ALUMINOSILICATE ZEOLITES

Brian R. Gane, Ottershaw, and Philip Howard, Teddington, both of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Feb. 16, 1984, Ser. No. 580,673

Claims priority, application United Kingdom, Mar. 9, 1983, 8306531

Int. Cl.³ B01J *25/04, 29/06*

U.S. Cl. 502—53 17 Claims

1. A process for activating an aluminosilicate zeolite loaded with a gallium compound as catalyst said process comprising bringing into contact the zeolite, before or after loading thereof with gallium, with steam and concurrently or separately with hydrogen, both stages being carried out at an elevated temperature.

3. A process according to claims 1 or 2 wherein the zeolite is subjected to a sequence of treatments comprising calcination (C), steaming (S), loading with a gallium compound (G), and binding (B) said sequence being selected from:

(a) C (s)* G B
(b) C (s)* B G
(c) C S G B
(d) C S B G
(e) C G S B
(f) C G B S
(g) C B G S
(h) C B S G
(i) B C (s)* G
(j) B C S G
(k) B C G S

wherein *C (s)-represents simultaneous calcination and steaming.

10. A process according to claim 1 wherein the steam and hydrogen treatments are carried out on a gallium loaded zeolite, which has been wholly or partially deactivated in use as a hydrocarbon conversion catalyst, as part of a regeneration procedure to restore and improve the activity thereof.

4,520,119

CRACKING CATALYST AND MANUFACTURE THEREOF

Robert W. Andrews, Toms River; Francis L. Himpsl, Matawan; Eugene B. Horvath, Freehold, and Barry K. Speronello, River Edge, all of N.J., assignors to Engelhard Corporation, Edison, N.J.

Filed Sep. 15, 1983, Ser. No. 532,346

Int. Cl.³ B01J *29/08*

U.S. Cl. 502—67 17 Claims

1. A process for producing an attrition-resistant zeolitic cracking catalyst which comprises providing a finely divided mixture comprising particles of sodium zeolite Y, sodium zeolite B and amorphous silica-alumina, mixing said mixture of particles with a solution of sodium silicate to form a slurry without milling, washing or drying said mixture prior to or subsequent to addition of sodium silicate, spray drying said slurry to form microspheres, forming an acidic slurry containing said microspheres and then subjecting the microspheres to ion-exchange treatment to reduce the sodium content thereof without an intermediate drying step.

2. The process of claim 1 wherein said mixture comprises about 20–40% sodium zeolite Y, about 20–40% sodium zeolite B and the balance being amorphous silica-alumina.

3. The process of claim 2 wherein said mixture is obtained as a by-product in the manufacture of a fluid cracking catalyst from microspheres of calcined clay and sodium hydroxide solution.

4,520,120
VANADIUM PASSIVATION IN A HYDROCARBON CATALYTIC CRACKING PROCESS

Bruce R. Mitchell, Lower Burrell, and Roger F. Vogel, Jefferson Township, Butler County, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Division of Ser. No. 536,754, Sep. 28, 1983, Pat. No. 4,451,355. This application Mar. 19, 1984, Ser. No. 590,944

Int. Cl.³ B01J *29/08*

U.S. Cl. 502—68 **3 Claims**

1. A catalyst composition comprising a crystalline aluminosilicate zeolite, a matrix material, and from 5 to 40 weight percent, based on the total catalyst, of a calcium-containing non-perovskite additive selected from the group consisting of calcium-titanium, calcium-zirconium, calcium-titanium-zirconium oxides and mixtures thereof, said additive being present as a discrete component of said catalyst composition.

2. A catalyst composition comprising a crystalline aluminosilicate zeolite, a matrix material and from 11 to 40 weight percent, based on the total catalyst, of a calcium-containing perovskite additive selected from the group consisting of calcium titanate, calcium zirconate and mixtures thereof, said additive being present as a discrete component of said catalyst composition.

4,520,121
MAGNESIUM HALIDE HYDRATES AND POLYMERIZATION CATALYSTS PREPARED THEREFROM

Kenneth E. Inkrott, and Gil R. Hawley, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 28, 1983, Ser. No. 546,712

Int. Cl.³ C08F *4/63*

U.S. Cl. 502—105 **14 Claims**

1. A process for preparing a catalyst useful for the polymerization of olefins comprising reacting a hydrous magnesium dihalide composition with reactants comprising a benzoic acid ester and an alkoxytitanium compound to form a first catalyst component, then reacting said first catalyst component with an organoaluminum halide to form a solid product, then reacting said solid product with a halogenating agent comprising a titanium halide, wherein the molar ratio of water to magnesium dihalide in said hydrous magnesium dihalide composition is in the range of about 0.5/1 to 2/1 and the hydrous magnesium dihalide composition is prepared by comminuting a mixture of an anhydrous magnesium dihalide and a hydrous magnesium dihalide at least until the amount of the most highly hydrated magnesium dihalide species in the comminuted product has become substantially stabilized.

4,520,122
IMMOBILIZATION OF ORGANIC SPECIES ON REFRACTORY INORGANIC OXIDES

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 5, 1983, Ser. No. 558,398

Int. Cl.³ B01J *20/22, 31/38, 31/36*; B01D *15/08*

U.S. Cl. 502—152 **20 Claims**

1. A method of preparing a modified refractory inorganic oxide comprising reacting the surface hydroxyl groups of a porous refractory inorganic oxide selected from the group consisting of alumina, silica, thoria, titania, magnesia, and combinations thereof with a tetrahalide of an element selected from the group consisting of titanium, zirconium, hafnium, vanadium, tantalum, niobium, germanium, tin, lead, and combinations thereof so as to produce a surface-metallated inorganic oxide, removing excess and unreacted metal tetrahalide, heating the metal inorganic oxide at a temperature from about 80° to about 200° C. in an inert atmosphere for a time sufficient to volatilize any remaining unreacted metal tetrahalide, reacting the resulting material with an organic reagent having at least one functional group selected from the group consisting of hydroxyl, amino, sulfhydryl, and phosphino moieties, or with RY where R is a hydrocarbyl moiety and Y is an alkali metal, removing excess adhering but unreacted reagent, and recovering the resulting modified refractory inorganic oxide.

8. The method fo claim 1 where the reagent has a hydroxyl group.

9. The method of claim 8 where the reagent is a hydroxy carboxylic acid or a hydroxy amine.

4,520,123
CATALYST SYSTEM AND PROCESS FOR POLYMERIZING CONJUGATED DIENES

James E. Hall, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Jul. 2, 1984, Ser. No. 627,246

Int. Cl.³ C08F *4/48*

U.S. Cl. 502—153 **12 Claims**

1. A catalyst system comprising

(a) at least one anionic initiator based on lithium, and

(b) at least one cyclic acetal of a glyoxal.

8. The catalyst system of claim 1 also containing

(c) at least one organomagnesium compound, organoaluminum compound or mixtures thereof.

4,520,124
METHOD FOR PRODUCING A CATALYTIC STRUCTURE FOR THE REDUCTION OF NITROGEN OXIDES

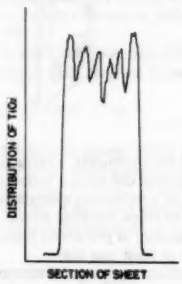
Kazunobu Abe, Izumi, and Tadao Nakatsuji, Matsubara, both of Japan, assignors to Sakai Chemical Industry Co., Ltd., Sakai, Japan

Continuation-in-part of Ser. No. 245,687, Mar. 19, 1981, Pat. No. 4,416,800, which is a division of Ser. No. 72,599, Sep. 5, 1979, Pat. No. 4,280,926. This application Sep. 12, 1983, Ser. No. 531,468

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ B01J *35/04, 31/28, 21/14, 21/12*

U.S. Cl. 502—159 **4 Claims**



1. A method for producing a catalyst structure in the form of porous sheet or honeycomb for the gas phase reduction of nitrogen oxides in the presence of ammonia, which comprises:

(a) bearing at least one of inorganic fibers of about 1–20 mm in fiber length and of about 0.1–30 microns in average diameter selected from the group consisting of ceramic fiber, silica fiber, silica-alumina fiber, chrysotile fiber, asbestos fiber, rock wool, glass fiber, anthophyllite fiber, potassium titanate fiber and carbon fiber, in water, to form a stock material containing the solid components in an amount of 1–10% by weight;

(b) forming the stock material into a sheet by paper making means and drying to produce a sheet which has a void fraction of 65–80%;

(c) impregnating the sheet or a honeycomb structure manufactured therefrom with an impregnating slurry containing titanium dioxide as a carrier material or its precursor

which will be converted into titanium dioxide when calcined in a concentration at least of 100 g/l and having a viscosity of 5–250 cps. at normal temperature, drying, and when necessary calcining the structure; and

(d) immersing the structure in a solution containing at least one catalytically active agent of an oxide selected from the group consisting of Cu, Fe, V, W and Mo or their precursors which will be converted into the oxides when calcined, drying and calcining the structure.

2. The method as claimed in claim 1 wherein titanium dioxide or its precursor which will be converted into titanium dioxide when calcined is admixed with the stock material so that the stock material contains the solid components in an amount of about 1–10% by weight which consist of not more than about 40% by weight of titanium dioxide or its precursor and not less than about 60% by weight of the fiber.

3. The method as claimed in claim 1 wherein the inorganic fiber is beaten together with a combustible organic fiber in amounts of about 1–30% by weight based on the inorganic fiber.

4,520,125
CATALYST FOR THE PREPARATION OF METHYL METHACRYLATE

Karl Baer, Weinheim; Peter Bassler, Hirschberg; Gerd Duembgen, Dannstadt-Schauernheim; Gerd Fouquet, Neustadt; Richard Krabetz, Kirchheim; Franz Merger, Frankenthal, and Friedbert Nees, Stutensee, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 23, 1984, Ser. No. 582,727

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1983, 3306907

Int. Cl.³ B01J *31/04, 23/62;* **C07C** *67/00, 69/54*

U.S. Cl. 502—170 **1 Claim**

1. In a catalyst for the preparation of a carboxylate from an aldehyde and an alkanol in the presence of oxygen, which as active components consists essentially of palladium and lead, these being present on a carrier containing zinc oxide, and the palladium being applied as a palladium salt in a solution containing hydrochloric acid and then being liberated by reduction and the lead being applied as lead acetate, wherein said palladium is present in a range of 0.1–10% by weight and said lead is present in a range of 0.1–20% by weight, both calculated as metal as a percentage of the total weight of the catalyst and carrier, the improvement being that the carrier consists solely of zinc oxide.

4,520,126
CATALYST COMPOSITION SUITABLE FOR THE DIMERIZATION OR CODIMERIZATION OF ALPHA-OLEFINS

Keiji Kawamoto, Hiroshima; Keigo Kato, Yono, and Takahiro Aida, Niitsu, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,959

Claims priority, application Japan, Dec. 28, 1981, 56-209969; Dec. 28, 1981, 56-209971

Int. Cl.³ B01J *27/20, 23/04;* **C07C** *11/10, 21/24*

U.S. Cl. 502—184 **9 Claims**

1. A catalyst composition for dimerizing or codimerizing alpha-olefins consisting essentially of a molded article comprising an anhydrous inorganic potassium compound, and metallic sodium and metallic potassium dispersed on the surface of the molded article, said molded article further containing 0.7 to 3% by weight, based on the weight of the inorganic potassium compound, of elemental carbon, the atomic ratio of metallic sodium to metallic potassium being in the range of from 20:80 to 90:10 and the total proportion of metallic sodium and metallic potassium is 0.5–10% by weight based on the weight of the inorganic potassium compound.

4. The composition of claim 1 wherein the inorganic potassium compound is potassium carbonate.

5. The composition of claim 1 wherein the molded article has a pore volume ratio of 22 to 38% and a compression strength of 1.5 to 15 kg/cm².G, and is obtained by compression-molding a mixture of an elemental carbon powder and a powder of the inorganic potassium compound, said inorganic potassium compound powder having such a particle size distribution that it has an average particle diameter in the range of 150 to 600 microns and contains 1 to 15% by weight of particles having a particle diameter of less than 100 microns and 1 to 20% by weight of particles having a particle diameter of more than 600 microns.

4,520,127
OXIDATION CATALYST COMPOSITION

Masayuki Otake; Masayoshi Murayama, and Yuji Kawaragi, all of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation of Ser. No. 473,196, Mar. 8, 1983, Pat. No. 4,472,527. This application Mar. 21, 1984, Ser. No. 591,997

Claims priority, application Japan, Mar. 31, 1982, 57-52645; Apr. 1, 1982, 57-54502; May 4, 1982, 57-74920; Nov. 17, 1982, 57-201728; Nov. 19, 1982, 57-203370; Nov. 22, 1982, 57-205255

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—209 **6 Claims**

1. An oxidation catalyst composition consisting essentially of a uniformly dispersed mixture of (a) a crystalline composite oxide containing vanadium and phosphorus having the characteristic X-ray diffraction peaks as identified in the following Table B, (b) an amorphous composite oxide containing vanadium and phosphorus and (c) silica, wherein (i) the content of the crystalline composite oxide is from 15 to 80% by weight, (ii) the atomic ratio of phosphorus to vanadium is from 0.8 to 1.5, (iii) the pore volume of the pores having a pore radius within a range of from 37 to 2000 Å is from 0.03 to 0.3 ml/g, and (iv) the pore volume of the pores having a pore radius within a range of from 100 to 350 Å is at least 50% of the pore volume of the pores having a pore radius within a range of from 37 to 2000 Å;

TABLE B

X-ray diffraction peaks (Anticathode: Cu—K_α) 2θ ($\pm 0.2°$)
14.2°
15.7°
18.5°
23.0°
28.4°
30.0°
33.7°
36.8°

4,520,128
CATALYST HAVING HIGH METAL RETENTION CAPACITY AND GOOD STABILITY FOR USE IN THE DEMETALLIZATION OF HEAVY CRUDES AND METHOD OF PREPARATION OF SAME

Alfredo L. Morales; Roberto E. Galiasso; Maria M. Agudelo; Jose A. Salazar, and Angel R. Carrasquel, all of Los Teques, Venezuela, assignors to Intevep, S.A., Caracas, Venezuela

Filed Dec. 19, 1983, Ser. No. 563,197

Int. Cl.³ B01J *27/18*

U.S. Cl. 502—210 **16 Claims**

1. A method for producing a catalyst for use in the hydrotreatment of heavy crudes and residues containing high levels of metals, sulphur, asphaltenes and Conradson carbon comprising the steps of:

providing an alumina carrier; and

impregnating said alumina carrier with (1) at least one hydrogenation component selected from the metallic ele-

ments of Group VIB of the Periodic Table so as to obtain a concentration of from about 5 to 30 weight percent of said element on said catalyst, (2) at least one metallic component selected from the metallic elements of Group VIII of the Periodic Table so as to obtain a concentration of from about 0.1 to 8 weight percent of said element on said catalyst and (3) a phosphorus oxide component so as to obtain a concentration of between 5 to 30 weight percent of phosphorus oxide on said catalyst wherein said phosphorus oxide is added in substantially stoichiometric quantities with respect to the metallic elements of Group VIB of the Periodic Table such that the ratio of phosphorus oxide to the oxide of the metallic elements of Group VIB on the surface of the catalyst is substantially unity.

13. A catalyst for use in the hydrotreatment of heavy crudes and residues containing high levels of metals, sulphur, asphaltenes and Conradson carbon by impregnating an alumina carrier in an aqueous solution containing a component selected from the metallic elements of Group VIB of the Periodic Table, a component selected from the metallic elements of Group VIII of the Periodic Table and a phosphorus oxide component wherein said phosphorus oxide is added in substantially stoichiometric quantities with respect to the metallic elements of Group VIB of the Periodic Table such that the ratio of phosohorus oxide to the oxide of the metallic elements of Group VIB on the surface of the catalyst is substantially unity, said catalyst having a surface area of between 120 to 400 m^2/g and a total pore volume of between 0.5 to 1.2 cc/g wherein between 60 and 100% of the total pore volume comprises pores having a diameter of between 60 to 300 Å.

4,520,129

HYDROGENATION CATALYST

Timothy P. Murtha, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 293,068, Aug. 17, 1981, Pat. No. 4,409,401. This application May 20, 1983, Ser. No. 496,783

Int. Cl.³ B01J *27/02, 31/02, 27/20*

U.S. Cl. 502—222 **10 Claims**

1. A process for the preparation of a hydrogenation catalyst consisting essentially of the steps of:

(1) contacting an inert support with a Group VIII metal substance chosen from nickel, platinum, and palladium,

(2) contacting the metal-containing support of (1) with an alkali metal promoter to form a catalyst composite,

(3) treating the composite with a compound of divalent sulfur, and

(4) heating the sulfided composite at an elevated temperature in the presence of an oxidizing gas and subsequently in the presence of a reducing gas to produce an active catalyst effective for the hydrogenation of unsaturated compounds.

4,520,130

HALOSILANE CATALYST AND PROCESS FOR MAKING SAME

Don H. Hashiguchi, University Heights; Erhard Klar, Beachwood, and Ronald J. Dietrich, Strongsville, all of Ohio, assignors to SCM Corporation, New York, N.Y.

Filed May 8, 1984, Ser. No. 608,293

Int. Cl.³ B01J *23/14, 23/72*

U.S. Cl. 502—345 **8 Claims**

1. A pyrometallurgically-sourced particulate catalyst composition for organohalosilane production, said composition consisting essentially of a major proportion of cuprous and cupric oxides, a minor proportion of elemental copper, containing tin in a proportion of about 400–3000 ppm, having average particle size not substantially above about 20 microns, and exhibiting crystal lattice distortion.

4,520,131

ANTIHYPERTENSIVE N-SUBSTITUTED 1,4-DIHYDROPYRIDINES

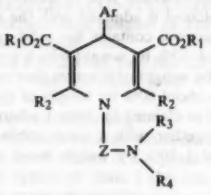
Bernard Loev, Scarsdale; Howard Jones, Ossining, both of N.Y., and John T. Suh, Greenwich, Conn., assignors to USV Pharmaceutical, Tuckahoe, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,957

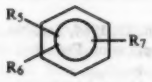
Int. Cl.³ C07D *211/90, 401/04, 405/04;* **A61K** *31/455*

U.S. Cl. 514—156 **4 Claims**

1. A compound of the formula



wherein Ar is heteroaryl and substituted heteroaryl selected from the group consisting of thiophene, furan, pyridine, thiazole, pyrimidine, pyrrole, benzofuran, quinoline, and benzothiophene, cycloalkyl having from 3 to 7 carbon atoms, naphthyl, indanyl, idenyl, tetrahydronaphthyl, or a radical of the formula



wherein each of R_5, R_6 and R_7 is independently H, alkyl, phenyl, tolyl, naphthyl, halo, lower alkoxy, nitro, amino, alkylmercapto, cyano, carboxy, carbalkoxy, sulfamyl, trifluoromethyl, hydroxy, methanesulfonyl, or alkylamino; and R_5 and R_6 when taken together, form a methylenedioxy; Z is alkylene containing 1 to about 5 carbon atoms in the principal chain; each R_1 is independently hydrogen, alkyl or alkoxyalkyl, with the proviso that only one R_1 may be hydrogen; R_2 is lower alkyl; R_3 is alkoxyalkyl containing 2 to 4 carbon atoms in the alkyl group and R_4 is hydroxyalkyl containing 2 to 4 carbon atoms in the alkyl group; wherein the alkyl, and alkoxy groups contain up to 10 carbon atoms, and pharmaceutically-acceptable salts thereof.

4. An anti-hypertensive composition comprising, as an active ingredient, an effective anti-hypertensive amount of a compound according to claim 1 in a pharmaceutically acceptable carrier.

4,520,132

USE OF UNDECYLENIC ACID TO TREAT HERPES LABIALIS

C. Richard Kinsolving, Monroe, N.Y., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sep. 27, 1982, Ser. No. 423,753

Int. Cl.³ A61K *31/20*

U.S. Cl. 514—560 **13 Claims**

1. A method of treating herpes I infection of the labial area in mammals comprising administrating to the mammals in need of said treatment by topical application in the area of said infection of an effective amount for treating said herpes I infection of undecylenic acid.

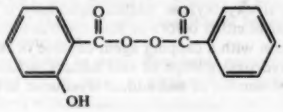
4,520,133

MONOHYDROXY-BENZOYL PEROXIDE AND COMPOSITIONS FOR TREATING ACNE

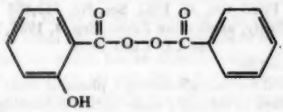
Allen I. Dines, Danbury; David Yeung, Stamford, and Sergio Nacht, Weston, all of Conn., assignors to Richardson-Vicks Inc., Wilton, Conn.

Filed Aug. 11, 1983, Ser. No. 522,207
Int. Cl.³ A61K *31/075*; C07C *179/15*
U.S. Cl. 514—568 5 Claims

1. 2-Hydroxy benzoyl peroxide of the formula



2. A composition for the topical treatment of acne in the form of a lotion, cream, gel or solution containing from about 1 to about 20% by weight of 2-hydroxy benzoyl peroxide of the formula



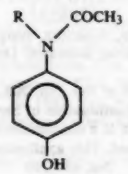
4,520,134

N-ALKYL-4'-HYDROXYACETANILIDES, PHARMACEUTICAL COMPOSITIONS COMPRISING THEM AND THEIR USE

Gerald M. Rosen, 403 Knob Ct., Chapel Hill, N.C. 27514

PCT No. PCT/US83/01311, § 371 Date Apr. 6, 1984, § 102(e) Date Apr. 6, 1984, PCT Pub. No. WO84/00886, PCT Pub. Date Mar. 15, 1984
Continuation-in-part of Ser. No. 412,313, Aug. 27, 1982, abandoned. This PCT application Aug. 26, 1983, Ser. No. 601,774
Int. Cl.³ A61Y *31/165*; C07C *103/38*
U.S. Cl. 514—625 21 Claims

1. A pharmaceutical composition comprising, in unit dosage form, an analgesic effective amount per unit dosage of an acetanilide compound of the formula



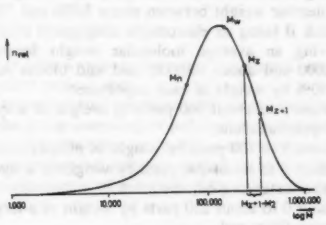
wherein R is methyl or branched or straight chain propyl, butyl, amyl, hexyl, heptyl, or octyl, in admixture with a pharmaceutically acceptable carrier.

4,520,135

PARTICULATE POLYSTYRENE CONTAINING BLOWING AGENT AND HAVING IMPROVED EXPANDABILITY

Klaus Hahn, Kirchheim; Paul Wittmer, Landau; Isidoor De Grave, Wachenheim; Rupert Schick, Limburgerhof, and Adolf Echte, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 13, 1983, Ser. No. 531,658
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1982, 3224660
Int. Cl.³ C08J *9/18*, *9/20*
U.S. Cl. 521—56 4 Claims



1. In a process for the preparation of particulate polystyrene containing a blowing agent in which styrene is polymerized in an aqueous suspension and in which a volatile organic blowing agent is added before, during or after the polymerization has taken place, the improvement which comprises: the adding of from 0.01 to 0.5% by weight of a bromine-free organic chain transfer agent having a chain transfer constant K of from 0.1 to 50 during the polymerization, at a styrene monomer conversion of from 20–90%.

4,520,136

FOAMABLE POLYMERIC STYRENE PARTICLES

Richard A. Schwarz, Big Spring, Tex., assignor to Cosden Technology, Inc., Dallas, Tex.

Filed Sep. 24, 1982, Ser. No. 422,766
Int. Cl.³ C08V *9/18*
U.S. Cl. 521—60 3 Claims

1. In a process for producing an expandable polymeric styrene particle wherein a polymeric styrene particle is impregnated with a blowing agent and the resultant expandable polymeric styrene particle recovered, the improvement which comprises impregnating the polymeric styrene particle with from about 0.2% to about 0.5% by weight of pentaerythritol tetrastearate and from about 1.0% to about 2.0% by weight of hexabromocyclododecane, all percentages being based on the weight of said polymeric styrene.

4,520,137

ONE-PART ACTIVATOR AND BLOWING AGENT FOR FOAMING PLASTICS

Roger G. Hamel, Methuen, and Susan B. Poulin, Woburn, both of Mass., assignors to Morton Thiokol Inc., Chicago, Ill.

Division of Ser. No. 536,332, Sep. 27, 1983,. This application Oct. 18, 1984, Ser. No. 635,016
Int. Cl.³ C08J *9/06*; B29N *7/20*
U.S. Cl. 521—79 12 Claims

1. A stable one-part borohydride activator concentrate which has been previously blended and melted consisting essentially an inert resinous polymer, an alkali metal borohydride and a salt hydrate.

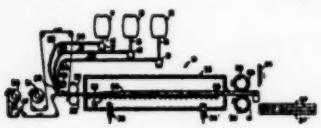
4,520,138
DULL, SMOOTH UNIT SOLES
Glenn R. Himes, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.
Filed Apr. 23, 1984, Ser. No. 603,022
Int. Cl.³ C08J 9/12
U.S. Cl. 521—91 14 Claims

1. A non-delaminating polymeric composition having a smooth, dull appearance in molded unit soles, said composition comprising:
(a) 100 parts by weight of one or more radial $(AB-)_x$ BA block copolymers where x is greater than 1, each block A being a monoalkenyl arene polymer having an average molecular weight between about 5,000 and 75,000, each block B being an elastomeric conjugated diene polymer having an average molecular weight between about 15,000 and about 300,000, and said blocks A comprise 8-90% by weight of each copolymer;
(b) about 5 to about 100 parts by weight of a syndiotactic 1,2-polybutadiene;
(c) about 5 to 100 parts by weight of polystyrene;
(d) about 0 to about 200 parts by weight of a hydrocarbon rubber extending oil;
(e) about 0 to about 250 parts by weight of a large particle porous filler; and
(f) about 0.01 to about 10 parts by weight of a blowing agent.

4,520,139
PECTIN AND RELATED CARBOHYDRATES FOR THE PREPARATION OF POLYURETHANE FOAMS
Richard B. Kennedy, Ridgefield, Conn., assignor to Patrick James Crehan and Richard J. Pricke, both of Ridgefield, Conn., a part interest to each
Filed Jul. 26, 1984, Ser. No. 635,212
Int. Cl.³ C08G 18/14
U.S. Cl. 521—109.1 22 Claims

1. A polyurethane foam made by reacting a composition containing a polyisocyanate, a surfactant, an amine type polyurethane producing catalyst, a gel forming polysaccharide and water.

4,520,140
POLYOXYALKYLENE/UNSATURATED DIESTER REACTION PRODUCT FOR CELLULAR FOAM STABILIZATION
Richard L. Frostzel, Clearwater, Fla., assignor to The Celotex Corporation, Tampa, Fla.
Division of Ser. No. 544,301, Oct. 21, 1983, Pat. No. 4,481,307, which is a division of Ser. No. 436,581, Sep. 29, 1982, Pat. No. 4,418,198, which is a division of Ser. No. 282,322, Jul. 10, 1981, Pat. No. 4,368,234. This application Oct. 22, 1984, Ser. No. 663,427
Int. Cl.³ C08J 9/14
U.S. Cl. 521—115 17 Claims



1. A foam material comprising the reaction product of:
A. polyisocyanurate polymer forming reactants,
B. a blowing agent, and
C. a surfactant which comprises the reaction product of
(a) a polyoxyalkylene adduct having the formula

H—(polyoxyalkylene chain)$_x$R,

wherein R is an organic or inorganic radical and x is the number of polyoxyalkylene chains reacted onto R, and
(b) an esterified unsaturated dibasic acid having the formula

$T^1O_2C—C_nH_{2n-2}—CO_2T^2$

wherein n is 2 or 3 and T^1 and T^2 are identical or different and represent a straight or branched, saturated or unsaturated hydrocarbon chain, in the presence of an effective amount of a free-radical initiator, and wherein the polyoxyalkylene adduct optionally is capped by treatment either before or after the free-radical initiated reaction with a capping agent capable of reacting with the hydroxyl groups of said adduct, whereby the hydroxyl number of said adduct is reduced to less than 50.

4,520,141
METHOD FOR MANUFACTURING PHENOLIC RESIN FOAM
Sadao Kumasaka, and Setsumi Tada, both of Tokyo, Japan, assignors to Toyo Rubber Chemical Industry Co., Ltd., Tokyo, Japan
Filed Aug. 31, 1982, Ser. No. 413,488
Claims priority, application Japan, Sep. 4, 1981, 56-139252
Int. Cl.³ C08J 9/08
U.S. Cl. 521—126 18 Claims

1. A method for manufacturing a phenolic resin foam, comprising the steps of mixing a composition consisting essentially of 100 parts by weight of a resol-type phenol-formaldehyde resin, 5 to 40 parts by weight of a curing agent consisting of an acid, and a foaming agent consisting of an isocyanate, and heating the composition to foam said composition and form said phenolic resin foam, the amount of the isocyanate being 5 to 30 parts by weight.

4,520,142
AEROSOL APPLICATION OF ENCAPSULATED MATERIALS
Roger W. Leinen, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Feb. 17, 1984, Ser. No. 581,334
Int. Cl.³ C09D 5/14; C09K 3/30
U.S. Cl. 523—206 18 Claims

1. An appliable composition comprising
(a) microcapsules having an average diameter between 3 and 75 microns containing a liquid within a shell,
(b) a film forming binder,
(c) a solvent for said film forming binder which is not an active solvent for the material comprising the shell of said microcapsule, and
(d) a propellant which is miscible with said solvent and which is not an active solvent for the material comprising the shell of said microcapsule.
9. An aerosol can containing the composition of claim 1.

4,520,143
COMPOSITIONS FOR THE TREATMENT OF TEXTILE MATERIALS
Thomas Jellinek, Fleuty, Australia, assignor to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia
Continuation-in-part of Ser. No. 300,217, Aug. 9, 1981, abandoned, which is a continuation of Ser. No. 178,371, Aug. 8, 1980, abandoned, which is a continuation of Ser. No. 033,904, Apr. 26, 1979, abandoned. This application May 13, 1983, Ser. No. 494,290
Claims priority, application Australia, May 9, 1978, PD4334
Int. Cl.³ C08L 33/08
U.S. Cl. 523—410 12 Claims

1. Compositions for textile treatment comprising an admixture of:

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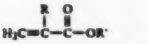
(a) an aqueous emulsion of a copolymer of a monomeric mixture consisting essentially of an oxirane-containing monoethylenically-unsaturated material and at least one other monoethylenically-unsaturated material selected from the group characterised by the formula



wherein R is H or C_1 to C_4 alkyl and R' is a straight chain or branched chain radical of a primary or secondary alkanol, alkoxyalkanol or alkylthiaalkanol having up to 14 carbon atoms, and

(b) a water soluble or water dispersible polyamine which is composed of at least 4 alkylenimine units (—CH—CH—N—) which occur in sequences of such alkylenimine units having the formula A

(A)

wherein R_1 and R_2 are independently selected from hydrogen, and lower alkyl radicals of 1 to 4 carbon atoms, R_3 is H or other alkylenimine sequences of formula A, and n is a number which has an average value of at least 2, wherein the admixture (a) and (b) is further characterised in that it exists as a stable emulsion at a pH in the range 3 to 11 and wherein the proportion of polyamine (b) is such that the sequences of alkylenimine units of formula A represent from 0.5% to 25% by weight of the non-volatile material in the combined mass of the emulsion copolymer and polyamine.

4,520,144

POLYDIMETHYLSILOXANE-MODIFIED POLYEPOXIDES

Gerry K. Nores, Hoffman Estates, and Mary F. Clifton, Woodstock, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Feb. 6, 1984, Ser. No. 577,353

Int. Cl.³ C08L 63/02, 83/08

U.S. Cl. 523—435 **7 Claims**

1. A modified polyepoxide reaction product of a diurethane diisocyanate with a resinous polyepoxide having a molecular weight of from about 500 to about 1000 and a 1,2-epoxy equivalency of from about 1.5 to about 2.0, said diurethane diisocyanate being itself the reaction product of a dicarbinol-terminated polydimethyl polysiloxane having a molecular weight of from about 1000 to about 4000 with substantially a 2:1 stoichiometric excess of an organic diisocyanate, said diurethane diisocyanate being reacted with said resinous polyepoxide in an amount of from about 1.5 moles to about 16 moles per 100 moles of the polyepoxide.

4,520,145

MODIFIED THERMOSETTING IMIDE RESINS WITH IMPROVED FRACTURE TOUGHNESS

Horst Stenzenberger, Schriesheim, Fed. Rep. of Germany, assignor to The Boots Company PLC, Nottingham, England

Filed Oct. 29, 1982, Ser. No. 437,794

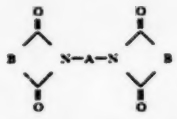
Claims priority, application United Kingdom, Jul. 21, 1982, 8221116

Int. Cl.³ C08G 18/00

U.S. Cl. 523—500 **28 Claims**

1. Curable bisimide resins resistant to microcracking comprising a mixture of

(a) at least one bisimide of the general formula I



(I)

in which B represents a divalent radical containing a carbon-carbon double bond and A is a divalent radical containing at least two carbon atoms,

(b) a polyisocyanate of the general formula (II)

$$D(NCO)_x \qquad \text{(II)}$$

in which x has a value in the range 2 to 4 and D stands for an x-valent radical, and

(c) said bisimide being modified with compounds selected from the group consisting of polyamines, polyhydrazides, amino acid hydrazides, azomethines and mixtures thereof and an unsaturated polyester which is obtained by the poly condensation of polycarboxylic acids with polyglycols.

4,520,146

CHEMICAL COMPOUNDS AND USE

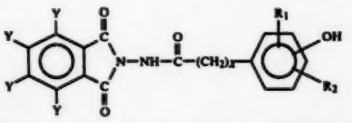
Ralph H. Hansen, Lincoln, Mass., assignor to Canusa Casting Systems Limited, Rexdale, Canada

Filed Sep. 27, 1983, Ser. No. 536,341

Int. Cl.³ C07D 209/48; C08K 5/34

U.S. Cl. 524—94 **12 Claims**

1. The compound of the formula I



(I)

where X is 1, 2 or 3; Y is Cl or Br; R_1 is tert-butyl and R_2 is H or lower alkyl of 1 to 4 carbons.

3. A composition comprising a polymer and the compound of claim 1 or 2 in an amount sufficient to impart flame retardant and antioxidant properties.

4,520,147

FLAME-PROOVED POLYAMIDE MOULDING MATERIALS

Rolf Dhein, Krefeld; Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen, all of Fed. Rep. of Germany, and Wolfgang Sieburg, Pittsburg, Pa., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 278,635, Jun. 29, 1981, Pat. No. 4,396,736. This application Mar. 25, 1983, Ser. No. 478,652

Int. Cl.³ C08K 5/34

U.S. Cl. 524—100 **5 Claims**

1. A self-extinguishing, optionally reinforced thermoplastic polyamide molding composition containing from 0.1 to 20% by weight of flame-proofing agents of the formula

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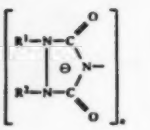
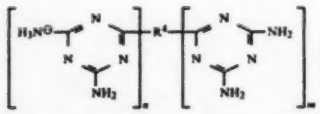




wherein R^1 and R^2 are each hydrogen, a C_1–C_6 aliphatic group, a C_4–C_{10} cycloaliphatic group, a C_7–C_{10} araliphatic group, a C_6–C_{10} aromatic group, one of said groups substituted by halogen or hydroxy, a C_2–C_6 alkyl carbonyl group or said group substituted by halogen; R^4 is hydrogen, amino, a C_1–C_{20} aliphatic group, a C_4–C_{17} cycloaliphatic group, a C_7–C_{17} araliphatic group, a C_6–C_{15} aromatic group or one of said groups substituted by halogen; n is an integer from 1 to 4 and m is an integer from 0 to 3, m+n being a maximum of 4.

4,520,148

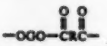
THERMOPLASTIC ELASTOMER COMPOSITIONS

Michael D. Golder, Allendale, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Dec. 1, 1983, Ser. No. 557,095
Int. Cl.³ C08L 67/02
U.S. Cl. 524—100 11 Claims

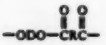
1. Thermoplastic elastomer composition consisting essentially of:

(a) segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented by the formula



Formula I

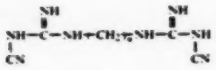
and said short chain units being represented by the formula



Formula II

where G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a difunctional polyether glycol having a number average molecular weight in the range from about 400 to about 6,000, R is a hydrocarbon radical remaining after removal of the carboxyl groups from terephthalic acid or isophthalic acid, and D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol or 1,4-butenediol; provided, said short chain units amount to between about 30% and about 85% by weight of the copolyester; and

(b) between about 0.05 and about 5% by weight of said copolyester of guanidine stabilizer of the formula



Formula III

where n is an integer between 2 and about 20

4,520,149

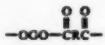
ELASTOMER COMPOSITIONS

Michael D. Golder, Allendale, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Dec. 1, 1983, Ser. No. 557,096
Int. Cl.³ C08L 67/02
U.S. Cl. 524—100 13 Claims

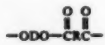
1. Thermoplastic elastomer composition consisting essentially of:

(a) segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented by the formula



Formula I

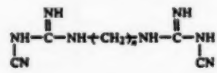
and said short chain units being represented by the formula



Formula II

where G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a difunctional polyether glycol having a number average molecular weight in the range from about 400 to about 6,000, R is a hydrocarbon radical remaining after removal of the carboxyl groups from terephthalic acid or isophthalic acid, and D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol or 1,4-butenediol; provided, said short chain units amount to between about 30% and about 85% by weight of the copolyester;

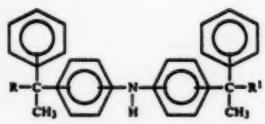
(b) between about 0.05 and about 5% by weight of said copolyester of guanidine stabilizer of the formula



Formula III

where n is an integer between 2 and about 20;

(c) between about 0.1 and about 5% by weight of said copolyester of diphenylamine derivative of the formula



Formula IV

where R and R^1 are methyl or phenyl; and

(d) between about 0.05 and about 3% by weight of said copolyester of phosphorus compound of the formula

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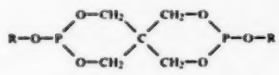
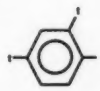
Formula V



where R represents an alkyl radical having from 6 to about 22 carbon atoms or a hydrocarbon radical of the structure



where t represents a tertiary butyl radical.

4,520,150

STABILIZED ELASTOMER COMPOSITIONS

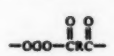
Michael D. Golder, Allendale, N.J., assignor to GAF Corporation, Wayne, N.J.

Filed Dec. 1, 1983, Ser. No. 557,097
Int. Cl.³ C08L 67/02
U.S. Cl. 524—100 10 Claims

1. Thermoplastic elastomer composition consisting essentially of:

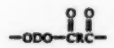
(a) segmented thermoplastic copolyester elastomer consisting essentially of a multiplicity of recurring long chain ester units and short chain ester units joined head to tail through ester linkages, said long chain units being represented by the formula

Formula I



and said short chain units being represented by the formula

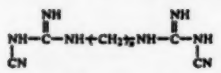
Formula II



where G is a divalent radical remaining after the removal of the terminal hydroxyl groups from a difunctional polyether glycol having a number average molecular weight in the range from about 400 to about 6,000, R is a hydrocarbon radical remaining after removal of the carboxyl groups from terephthalic acid or isophthalic acid, and D is a divalent radical remaining after removal of hydroxyl groups from 1,4-butanediol or 1,4-butenediol; provided, said short chain units amount to between about 30% and about 85% by weight of the copolyester;

(b) between about 0.05 and about 5% by weight of said copolyester of guanidine stabilizer of the formula

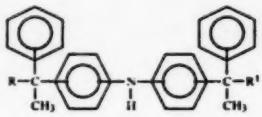
Formula III



where n is an integer between 2 and about 20;

(c) between about 0.1 and about 5% by weight of said copolyester of diphenylamine derivative of the formula

Formula IV



where R and R^1 are methyl or phenyl; and

(d) between about 0.05 and about 3% by weight of said copolyester of phosphorus compound of the formula

Formula V

where each of R and R_1 independently represents a hydrocarbon radical selected from the group consisting of alkyl, aryl and alkyl/aryl hydrocarbon radicals having from 1 to about 22 carbon atoms and R_3 represents hydrogen or a hydrocarbon radical selected from the group consisting of alkyl, aryl and alkyl/aryl hydrocarbon radicals having from 1 to about 22 carbon atoms.

4,520,151

TRIS (3,6-DI-T-BUTYL-2-NAPHTHYL) PHOSPHITE AND COMPOSITIONS THEREOF

Dwight W. Chasar, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Apr. 2, 1982, Ser. No. 364,593
Int. Cl.³ C08K 5/34, 5/52; C07F 9/141
U.S. Cl. 524—101 12 Claims

1. Tris(3,6-di-t-butyl-2-naphthyl)phosphite.

2. A composition comprising organic materials subject to degradation and a stabilizing amount of tris(3,6-di-t-butyl-2-naphthyl)phosphite.

4,520,152

FLAME RETARDANT COMPOSITION OF POLYPHENYLENE ETHER, STYRENE RESIN AND CYCLIC PHOSPHONATE

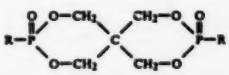
Robert J. Axelrod, Glenmont, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 831,056, Sep. 6, 1977, abandoned. This application Jun. 11, 1982, Ser. No. 387,499
Int. Cl.³ C08K 5/53
U.S. Cl. 524—120 17 Claims

1. A flame retardant composition comprising

(a) a normally flammable composition comprising a polyphenylene ether resin and a styrene resin, and

(b) an effective, flame-retardant amount of a compound of the formula



wherein R is alkyl of from 1 to 18 carbon atoms, aryl or alkaryl.

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4,520,153

PRODUCTION OF PAINT CONTAINING LECITHIN-TREATED METAL OXIDE

Max Kronstein, Riverdale, N.Y., and Joseph Eichberg, Atlanta, Ga., assignors to American Lecithin Company, Atlanta, Ga.

Filed Nov. 23, 1982, Ser. No. 443,899
Int. Cl.[3] C08K 5/52, 5/56; C23F 11/10
U.S. Cl. 524—145 24 Claims

1. Process for the production of a paint containing a chemically-modified lecithin material, which is a reaction product between lecithin and metal oxide comprising mechanically treating lecithin material with metal oxide without any application of heat, thereby producing lecithin-treated metal oxide and metal oxide-treated lecithin, separating the lecithin-treated metal oxide and the metal oxide-treated lecithin, drying the lecithin-treated metal oxide, dispersing the lecithin-treated metal oxide by pressure or milling into a powder form, and using said powder as a pigment in the formulation of a solvent-based or water-based paint, such mechanically-with-lecithin-pretreated pigment being used either as the only pigment or together with another pigment, untreated or lecithin-pretreated, whereby such resultant paint has different properties than a paint of the same formulation but having the same pigment or pigments without any prior lecithin pretreatment.

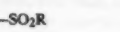
4,520,154

ORGANIC THIOSULPHATES AND THIOSULPHONATES USEFUL AS STABILIZING AGENTS FOR RUBBER VULCANIZATES

Philippe G. Moniotte, Heron, Belgium, assignor to Monsanto Europe, S.A., Brussels, Belgium

Division of Ser. No. 393,950, Jun. 30, 1982, Pat. No. 4,417,012.
This application Aug. 25, 1983, Ser. No. 526,189
Claims priority, application United Kingdom, Jul. 8, 1981, 8121098; Aug. 13, 1981, 8124716
The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.
Int. Cl.[3] C08L 9/00
U.S. Cl. 524—157 21 Claims

1. A vulcanisable rubber composition comprising a diene rubber, sulphur and a vulcanisation accelerator, characterised in that the composition also comprises a stabiliser material containing two or more groups of the formula



where R represents (a) a radical OM where M is a monovalent metal, the equivalent of a multivalent metal, a monovalent ion derived by the addition of a proton to a nitrogenous base, or the equivalent of a multivalent ion derived by the addition of two or more protons to a nitrogenous base, or (b) an organic radical selected from aliphatic, cycloaliphatic, aromatic and heterocyclic radicals which are combinations of any two or more such radicals, the groups of the aforesaid formula being linked by an organic bridging broup or attached to an organic polymer chain.

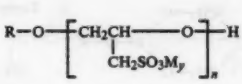
4,520,155

DYE-RECEPTIVE POLYOLEFINS AND POLYOLEFIN FIBERS

William A. Higgins, Gates Mills, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Apr. 23, 1984, Ser. No. 603,066
Int. Cl.[3] C08K 5/42
U.S. Cl. 524—166 23 Claims

1. A dyeable polyolefin composition comprising a blend of (A) a polyolefin and (B) a dye-receptive amount of at least one metal sulfonate which is soluble in the polyolefin when melted, and which sulfonate is characterized by the formula



(I)

wherein
R is an aliphatic group,
M is an alkali or alkaline earth metal,
n is at least 1,
y is equal to 1 when M is an alkali metal and ½ when M is an alkaline earth metal.

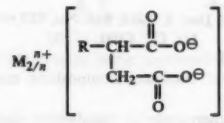
4,520,156

SCORCH INHIBITORS FOR CARBOXYLATED RUBBERS

Donald C. Grimm, Tallmadge, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Sep. 7, 1984, Ser. No. 648,394
Int. Cl.[3] C08K 5/09
U.S. Cl. 524—397 22 Claims

1. An improved scorch resistant carboxylated rubber composition comprising: (1) a carboxylated rubber and (2) at least one salt of a succinic acid derivative having the structural formula:



wherein R is an alkyl or alkenyl moiety containing from 8 to 25 carbon atoms wherein M is a cation having a charge of positive one or positive two, and wherein n is 1 or 2 with the proviso that n is 1 if M has a charge of positive one and with the proviso that n is 2 if M has a charge of positive two; which is distributed throughout said carboxylated rubber composition to improve the scorch safety of said rubber composition.

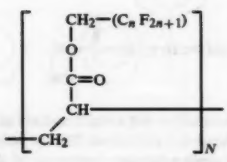
4,520,157

EARLY WARNING FIRE-DETECTION PAINT

Lymperios N. Yannopoulos, Penn Hills; Robert D. Straw, Murrysville, and D. Colin Philips, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 22, 1982, Ser. No. 452,264
Int. Cl.[3] C08K 5/02
U.S. Cl. 524—462 3 Claims

3. A latex paint mixture for producing, in its applied environment, an early warning of the presence of excessive heat from a painted surface, said latex paint mixture prior to application substantially comprising a mixture of pigment and vehicle and having admixed therewith a predetermined proportion of solution which includes a thermoparticulating agent, said solution which includes said thermoparticulating agent being present in an amount of from about 5% to about 21% by weight of said mixture and said thermoparticulating agent is a fluorinated polyacrylate comprising about 14% by weight of said solution, said fluorinated polyacrylate having the following structure;



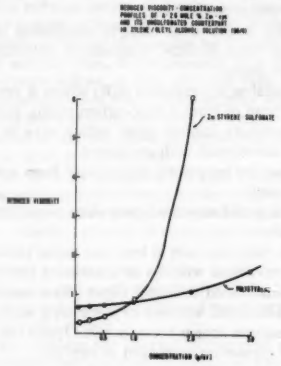
wherein n is 1 to 9 and N is 5 to 4,000.

4,520,158

NONAQUEOUS SOLVENT SOLUBLE POLYAMPHOLYTES-VISCOSIFIER AND SHEAR THICKENING ADDITIVE

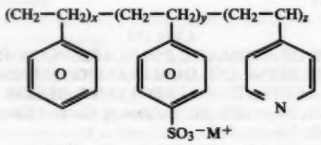
Dennis G. Peiffer, East Brunswick; Robert D. Lundberg, Bridgewater; Ilan Duvdevani, Leonia, and Warren A. Thaler, Flemington, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 6, 1984, Ser. No. 638,302
Int. Cl.³ C08K *5/01;* **C08L** *39/00*
U.S. Cl. 524—481 **7 Claims**



1. A process for increasing the viscosity of a hydrocarbon organic liquid under increasing shear rate which includes the step of:

(a) forming a solution of said hydrocarbon organic liquid and a polyampholyte having about 1 to about 500 milliequivalents of sulfonate groups per 100 gms. of said polyampholyte, wherein the concentration of said polyampholyte is about 0.01 to about 20 wt.%, said polyampholyte having the formula:



wherein x is about 40 to about 98 mole %, y is about 1 to about 50 mole %, and z is about 1 to about 50 mole %, wherein y and z are less than 60 mole %, and M is an amine or a metal cation selected from the group consisting of aluminum, iron, lead, Groups IA, IIA, IB and IIB of the Periodic Table of Elements; and

(b) subjecting said solution to increasing shear rate to increase the viscosity of said solution by at least 10% as said shear rate increases.

4,520,159

PROCESS FOR PRODUCING POLYAMINOPOLYAMIDES CONTAINING HALOHYDRIN FUNCTIONALITY

William W. Maslanka, Landenberg, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Mar. 21, 1984, Ser. No. 591,734
Int. Cl.³ C08L *77/06*
U.S. Cl. 524—606 **8 Claims**

1. A process for producing an aqueous solution of a cationic resinous composition suitable as a wet strength agent for paper and containing a polyaminopolyamide having a major portion of halohydrin functionality as substituents on tertiary nitrogen atoms, which process comprises reacting in aqueous medium a water-soluble basic polyaminopolyamide derived from a polyalkylene polyamine having two primary amine groups and at least one secondary amine group and a saturated aliphatic dicarboxylic acid or its ester and having a basicity essentially due to secondary amine groups with from 1 mole to 1.5 moles of allyl halide per mole of secondary amine groups in said basic polyaminopolyamide to form allyl substituted tertiary amine groups, removing unreacted allyl halide, reacting the resulting allyl substituted polyaminopolyamide with hypohalous acid until substantially all of the allyl substituents are converted to the corresponding halohydrin moieties, adjusting the pH of the resulting aqueous solution to at least 7.0 and maintaining the solution at a pH of at least 7.0 until the viscosity of the polyaminopolyamide containing halohydrin functionality reaches at least B on the Gardner-Holdt scale when measured at 24% solids at 25° C.

4,520,160

ORGANOPOLYSILOXANE EMULSIFIER COMPOSITIONS AND METHOD THEREFOR

Paul L. Brown, Saginaw, Mich., assignor to Dow Corning Corporation, Midland, Mich.

Filed Dec. 27, 1983, Ser. No. 565,554
Int. Cl.³ C08K *5/05*
U.S. Cl. 524—765 **6 Claims**

1. In the method for preparing an organopolysiloxane-polyoxyalkylene copolymer composition, said method comprising reacting an organohydrogenpolysiloxane reactant with an olefinically substituted polyoxyalkylene reactant in the presence of a platinum-containing hydrosilylation catalyst, the improvement comprising conducting said reacting in the presence of a reaction-improving amount of an alcohol which has at least 8 carbon atoms and is free of aliphatic unsaturation and allowing said alcohol to remain with the composition after said reacting.

4,520,161

HIGH HOT BOND STRENGTH HIGH FLASH POINT LOW VISCOSITY POLYESTER INSULATING COMPOSITIONS

Daniel R. Sassano, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 14, 1984, Ser. No. 620,666
Int. Cl.³ C08G *63/76;* **C08L** *67/06*
U.S. Cl. 525—11 **12 Claims**

1. A fluid, high bond strength, high flash point, solventless, insulating composition, comprising:

(1) 100 parts by weight of a polyester composition consisting essentially of the admixture:

(A) from 9 mole % to 12 mole % of a dicarboxylic acid selected from the group consisting of isophthalic acid, endo methylene tetrahydrophthalic acid, their anhydrides, and their mixtures;

(B) from about 15 mole % to about 20 mole % of an unsaturated aliphatic dicarboxylic acid;

(C) from about 35 mole % to about 40 mole % of an aliphatic dihydric alcohol;

(D) from about 25 mole % to about 40 mole % of diallyl phthalate;

(E) an effective amount of an inhibiting agent;

(2) from 15 parts by weight to 30 parts by weight of hexamethoxy methyl melamine; and

(3) an effective amount of a free radical initiator catalyst.

4,520,162

POLYMERIC COMPOUNDS WITH SUSTAINED ANTI-TUMOR ACTIVITY AND A METHOD FOR THE PREPARATION THEREOF

Takashi Hirano; Shinichi Ohashi, both of Sakura; Satoshi Morimoto, Yatabe; Masaru Shiraki; Keishiro Tsuda, both of Sakura; Tomowo Kobayashi, and Shigeru Tsukagoshi, both of Tokyo, all of Japan, assignors to Director-General of the Agency of Industrial Science & Technology, Tokyo, Japan

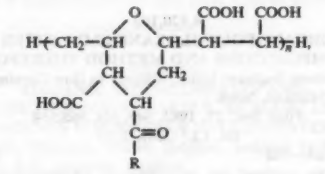
Filed Sep. 17, 1984, Ser. No. 651,343

Claims priority, application Japan, Sep. 24, 1983, 58-176833; Sep. 24, 1983, 58-176834

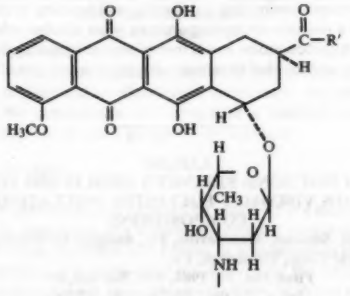
Int. Cl.³ C08F *8/32*

U.S. Cl. 525—327.6 5 Claims

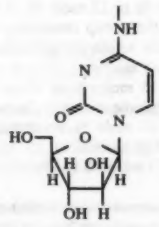
1. A polymeric compound having a polymeric backbone structure which is a copolymeric moiety of maleic anhydride and divinyl ether and at least one pendant moiety thereon selected from the class consisting of adriamycin, daunomycin and 1-β-D-arabinofuranosylcytosine bonded to the backbone structure through an amide linkage at the maleic anhydride unit thereof with the maleic anhydride units converted to carboxyl acid form comprising a unit represented by the structural formula



in which n is a positive integer and R is the pendant moiety expressed by the formula



R' being a hydroxyl group or a methyl group, or the formula



or a pharmacologically acceptable salt thereof.

4,520,163

PROCESS OF SEQUENTIALLY COPOLYMERIZING PROPYLENE-ETHYLENE COPOLYMERS AND CATALYST THEREFOR

Brian L. Goodall, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Jan. 9, 1984, Ser. No. 569,366

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—53 11 Claims

1. In the process for preparing impact resistant ethylene-propylene polymers having high impact properties combined with high stiffness, which process comprises:

(a) preparing a propylene prepolymer by polymerizing propylene in a liquid phase reaction zone in the presence of a catalyst system comprising:

(i) a highly active solid catalyst component comprising titanium tetrachloride, magnesium chloride, and an electron donor,

(ii) as cocatalyst a compound AlR_3 where R represents an alkyl group of from 2 to 8 carbon atoms, and

(iii) a selectivity control agent which may be partly or totally complexed with cocatalyst;

(b) separating the propylene prepolymer from volatile constituents; and

(c) introducing said separated propylene prepolymer, ethylene monomer

and propylene monomer into at least one vapor phase reaction zone; the improvement wherein an additional amount of said cocatalyst is introduced into said vapor phase reaction zone, wherein the additional amount of cocatalyst added to said vapor phase reaction zone is between two (2) and ten (10) times the amount of cocatalyst employed in step (a).

4,520,164

BLENDS OF AROMATIC POLYCARBONATE RESINS, POLYOLEFINS AND OLEFIN COPOLYMERS, AND ACRYLATE INTERPOLYMER RESINS

Ping Y. Liu, Naperville, Ill., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 22, 1982, Ser. No. 452,060

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—67 16 Claims

1. A thermoplastic composition, comprising an intimate blend of

(a) a major proportion of an aromatic polycarbonate resin;

(b) at least about 10.4 parts by weight of a polyolefin or an olefin copolymer resin per 100 parts by weight of (a) and (b) combined; and

(c) a third polymeric component comprising

(i) a polymerization product of acrylic comonomers, or an acrylic monomer with a diene rubber, alone, or including styrene or

(ii) a multiphase interpolymer of a first elastomeric phase comprising an acrylic rubber and a rigid thermoplastic final phase, or

(iii) a mixture of (i) and (ii), the amount of (c) being at least sufficient to impart to the blend a resistance to environmental stress cracking and crazing greater than that possessed by (a) and (b) together.

4,520,165
ABS-MOULDING COMPOSITIONS

Karl Zabrocki, Buettgen; Karl-Heinz Ott, Leverkusen; Adolf Schmidt, Cologne, and Alfred Pischtschan, Kuerten, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 574,870

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1983, 3304544

Int. Cl.³ C08L *55/02*

U.S. Cl. 525—84 **1 Claim**

1. Molding compositions based on ABS-polymers consisting of

from 10 to 65% by weight of a graft polymer obtained by the emulsion polymerization of styrene and acrylonitrile in a ratio by weight of from 90:10 to 50:50, the styrene being completely or partly replaceable by α-methyl styrene or methyl methacrylate, in the presence of at least 2 butadiene polymer latices of type (A) and type (B), each of which contains from 0 to 30% of another vinyl monomer in copolymerized form, the ratio by weight of the monomers used to the butadiene polymer used amounting to between 35:65 and 70:30, and

from 90 to 35% by weight of at least one copolymer of styrene and acrylonitrile in a ratio by weight of from 90:10 to 50:50, the styrene being completely or partly replaceable by α-methyl styrene or methyl methacrylate, characterized in that

the butadiene polymer latex (A) has a particle diameter d_{50} of $\geqq 0.35$ μm and a gel content of $<85\%$, and

the butadiene polymer latex (B) used has a particle diameter d_{50} of $\leqq 0.30$ μm and

the average grafting site interval of the graft polymer produced therefrom amounts to between 4000 and 10,000 C_4-units.

4,520,166
VINYL CHLORIDE POLYMER COMPOSITION

Kazumasa Kamada; Norihisa Osaka, and Masahiro Kaneda, all of Otake, Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 263,725, May 14, 1981, abandoned. This application Mar. 21, 1983, Ser. No. 477,500

Claims priority, application Japan, May 20, 1980, 55-66893

Int. Cl.³ C08L *33/04*

U.S. Cl. 525—85 **14 Claims**

1. A vinyl chloride polymer composition having an excellent workability, comprising:

(1) from 80% to 99.95% by weight of a polymeric ingredient (I) consisting of at least one member selected from the group consisting of polyvinyl chloride and copolymers of at least 80% by weight of vinyl chloride and no more than 20% by weight of at least one other ethylenically unsaturated comonomer; and

(2) from 0.05% to 20% by weight of a polymeric ingredient (II) consisting of at least one three-stage emulsion polymerization product prepared by the steps of:

(A) first polymerizing from 40 to 70 parts by weight of a first monomeric component (b) in the presence of from 5 to 45 parts by weight of a polymeric component (a) obtaining a first polymerization product, said first polymerizing being conducted in a medium containing at least 0.1 parts by weight of a chain transfer agent per 100 parts by weight of said first monomeric component (b) under polymerization conditions which will cause a solution of 0.1 g of a polymerization product from said monomeric component (b) alone in 100 ml of chloroform to exhibit a reduced viscosity of 1 or less at a temperature of 25° C., said polymeric component (a) being prepared by polymerizing at least one monomeric material (a') selected from the group consisting of methyl methacrylate and monomeric mixtures of at least 50% by weight of methyl methacrylate or no more than 50% by weight of at least one other ethylenically unsaturated comonomer in the presence of from 0 to 2.0 parts by weight of a chain transfer agent per 100 parts by weight of said monomeric material (a'), and said first monomeric component (b) consisting of a member selected from the group consisting of (1) alkyl acrylates in which the alkyl group has from 1 to 18 carbon atoms, (2) benzyl acrylate, (3) mixtures thereof and (4) monomeric mixtures of at least 30% by weight of at least one member selected from the group consisting of alkyl acrylates in which the alkyl group has from 1 to 18 carbon atoms and benzyl acrylate and no more than 70% by weight of at least one member selected from the group consisting of alkyl methacrylates in which the alkyl group has from 2 to 18 carbon atoms and benzyl methacrylate; and

(B) second polymerizing, in the presence of the first polymerization product, from 5 to 40 parts by weight of a second monomeric component (c) consisting of a member selected from the group consisting of methyl methacrylate and monomeric mixtures of at least 50% by weight of methyl methacrylate and no more than 50% by weight of at least one other ethylenically unsaturated comonomer copolymerizable with methyl methacrylate in the presence of from 0 to 1.0 part by weight of a chain transfer agent per 100 parts by weight of said second monomeric component (c), the sum of the polymeric component (a), the first monomeric component (b), and the second monomeric component (c) being 100 parts by weight, and the preparation of said polymeric component (a) and said first and second polymerization reactions being carried out at a temperature of below 100° C. in the presence of from 0.1 to 20 parts by weight of an emulsifying agent and from 0.05 to 10 parts by weight of an initiator per 100 parts by weight of the sum of said components (a), (b) and (c).

4,520,167
HYDROXYALKYL CARBAMATE DILUENT FOR COATING COMPOSITIONS AND COMPOSITIONS CONTAINING THE SAME

Werner J. Blank, Wilton, and Girish G. Parekh, Fairfield, both of Conn., assignors to American Cyanamid Co., Stamford, Conn.

Filed Feb. 17, 1984, Ser. No. 581,007

Int. Cl.³ C08L *75/00*

U.S. Cl. 525—131 **14 Claims**

1. A coating composition comprising:

(a) a hydroxyalkyl carbamate compound of the formula

wherein n=0 or 1, R is a C_1 to C_{20} organic moiety which may contain one or more constituents selected from the class consisting of hetero-atoms and hydroxyl groups, and each of R_1, R_2 and R_3 is independently H or CH_3;

(b) an amide-aldehyde cross-linker; and

(c) a polymer containing active sites which, at elevated temperatures are reactive with the amide-aldehyde cross-linker (b);

the compound (a), the cross-linker (b) and the polymer (c) being stable relative to each other in the composition while at ambient temperature, and reactive at elevated temperature.

4,520,168
COLOR IMPROVED POLYARYLATE

James H. Kawakami, Piscataway; Benito See, Belle Mead; Thomas R. Jones, Lebanon, and Louis M. Maresca, Belle Mead, all of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Division of Ser. No. 393,556, Jun. 30, 1982, Pat. No. 4,439,586. This application Mar. 27, 1984, Ser. No. 593,743

Int. Cl.³ C08G *63/18*

U.S. Cl. 525—169 **3 Claims**

1. A color improved polyarylate polymer having a reduced viscosity of from about 0.1 to greater than 1.0 dl/g produced by the process which comprises the following steps:

(a) reacting an acid anhydride derived from an acid containing from 2 to 8 carbon atoms with at least one dihydric phenol to form the corresponding diether; and

(b) reacting said diester with at least one aromatic dicarboxylic acid at a temperature sufficient to form the polyarylate, wherein the improvement comprises carrying out said process in the presence of from about 0.2 to about 2.0 weight percent, based on the weight of the reaction mixture of an adsorbent selected from silica gel, activated charcoal or a molecular seive.

4,520,169
ELASTOMERIC SOL/GEL BLENDS

John F. Hagman, and Chi-Kai Shih, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 2, 1982, Ser. No. 414,451

Int. Cl.³ C08L *13/00, 23/34*

U.S. Cl. 525—185 **26 Claims**

1. A process for improving the processability of an uncured, soft elastomer (E), wherein elastomer (E), 30–99 parts by weight, is blended with a composition selected from the class of compositions (1) and (2), wherein

(1) is a mixture, which may be prepared in situ, of uncrosslinked polymer (T), which is a copolymer of ethylene with carbon monoxide and with at least one ethylenically unsaturated monomer X selected from the class consisting of C_3–C_{20} α,β-unsaturated mono- and dicarboxylic acids, C_1–C_{18} alkyl esters of α,β-unsaturated C_3–C_{20} mono- and dicarboxylic acids, vinyl esters of C_1–C_{18} saturated carboxylic acids, vinyl C_1–C_{18} alkyl ethers, acrylonitrile, and methacrylonitrile

with an effective amount of a crosslinking agent for polymer (T), which does not substantially cure elastomer (E);

the total amount of polymer (T) plus crosslinking agent being about 1–70 parts by weight; and

(2) is a blend of polymer (T) with an effective amount of a crosslinking agent for polymer (T) and with soft elastomer (E_1), which is not substantially curable by the crosslinking agent for polymer (T), and which may be the same as elastomer (E); the amount of elastomer (E_1) being about 30–99 weight percent of the blend, and the amount of polymer (T) plus crosslinking agent being about 1–70 weight percent, said blend having been prepared under shear conditions, the amount of shear and the temperature being such that the resulting blend has a gel content of about 1–70%, and the gel forms a dispersed phase in a sol matrix;

the amount of blend (2) being about 1–70 parts by weight;

with the proviso that blending of elastomer (E) with composition (1) is carried out under shear conditions, the amount of shear and the temperature being such that the resulting blend has a gel content of about 1–70%, and the gel forms a dispersed phase in a sol matrix.

4,520,170
METHOD FOR REINFORCING PERFLUOROELASTOMER COMPOSITIONS

David P. Kitto, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 20, 1982, Ser. No. 420,478

Int. Cl.³ C08L *27/16, 27/18, 27/20*

U.S. Cl. 525—200 **10 Claims**

1. A method for the preparation of perfluoroelastomer parts having high multidirectional tear strength comprising:

(a) preparing a blend of the perfluoroelastomer with 1 to 40 parts of fibrillated polytetrafluoroethylene,

(b) cryogenically pulverizing the blend produced from step (a) into a powder,

(c) placing the powder produced from step (b) into a mold and press-curing the powder into the desired shape for the perfluoroelastomer part.

4,520,171
POLYMERIC HINDERED AMINES

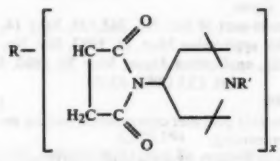
Diveley William R., and Anthony B. Clayton, both of Wilmington, Del., assignors to Hercules Incorporated, Wilmington, Del.

Filed May 5, 1982, Ser. No. 375,260

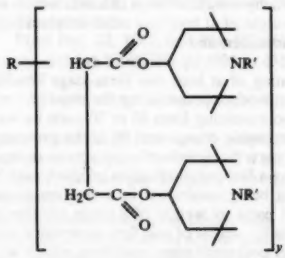
Int. Cl.³ C08F *29/12;* C07D *401/07*

U.S. Cl. 525—279 **8 Claims**

1. A hindered amine substituted, maleic anhydride modified olefin polymer having a general formula selected from the class consisting of



and



wherein R is an alpha-olefin polymer or copolymer residue and x and y are integers of a size relative to the molecular weight of R such that the total substitution of tetramethyl piperidine residue is between about 0.2 and 10% by weight, based on the total weight of the modified olefin polymer, and R′ is H, OH, O′, or O—R″, where R″ is a lower alkyl or substituted lower alkyl group having at least one hydrogen atom on the carbon attached to the nitrogen atom.

4,520,172

METHOD FOR COATING MEDICAMENTS

Klaus Lehmann, Rossdorf; Dieter Dreher, Darmstadt; Hubert Rauch, Weiterstadt, and Werner Siol, Pfungstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,469

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1982, 3208791

Int. Cl.³ C08F *8/28, 8/12, 8/44*

U.S. Cl. 525—369 9 Claims

1. A method for making an aqueous dispersion of a synthetic resin binder, said dispersion being adaptable to the coating of pharmaceutical dosage forms, which method comprises adding a powdered synthetic resin binder, capable of salt formation, to water and dispersing said resin in the presence of such an amount of a salt forming agent reacting with said resin that, after reaction from 0.1 to 10 percent of said resin, by weight, is present in salt form, said resin being prepared by the free radical emulsion polymerization of

(A) from 20 to 85 percent by weight of at least one alkyl acrylate or alkyl methacrylate,

(B) from 80 to 15 percent by weight of at least one vinyl or vinylidene monomer having an amino or carboxylic acid group capable of salt formation,

(C) from 0 to 30 percent by weight of at least one other vinyl or vinylidene monomer copolymerizable with (A) and (B).

8. A powdered mixture suitable for dispersion in water to form an aqueous dispersion adaptable to the coating of pharmaceutical dosage forms, said mixture comprising a powdered synthetic resin prepared by the free radical emulsion polymerization of

(A) from 20 to 85 percent by weight of at least one alkyl acrylate or alkyl methacrylate,

(B) from 80 to 15 percent by weight of at least one vinyl or vinylidene monomer having an amino or carboxylic acid group capable of salt formation,

(C) from 0 to 30 percent by weight of at least one other vinyl or vinylidene monomer copolymerizable with (A) and (B),

and such an amount of a powered agent capable of forming a salt with said resin as will salify from 0.1 to 10 percent of said resin, by weight, on reaction therewith.

4,520,173

MATERIAL FOR DEAERATING COATING SYSTEMS

Hans-Ferdi Fink; Otto Klocker; Koerner, Götz, all of Essen; Gert Künzel, Ratingen; Gerd Rossmy, Haltern-Lavesum, and Christian Weitemeyer, Esen, all of Fed. Rep. of Germany, assignors to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Apr. 7, 1983, Ser. No. 482,947

Claims priority, application Fed. Rep. of Germany, May 18, 1982, 3218676

Int. Cl.³ C08L *71/02*

U.S. Cl. 525—403 6 Claims

1. In an aqueous phase coating composition which contains polymeric, organic film formers, the improvement which comprises said composition containing a deaerating effective amount of a linear polymer having at least five side groups, each of which contains a silicon atom which is linked by way of a divalent hydrocarbon group to the polymer, each silicon atom carrying at least one R^1 group of formula

$$O-[C_nH_{2n}O-]_xQ$$

in which

n is 2 to 8,

x is 1 to 10 and

Q is an alkyl radical with 1 to 10 carbon atoms, an aryl radical, an alkaryl radical, or an acyl radical with 2 to 18 carbon atoms,

and the sum of the carbon and oxygen atoms of R^1 is not less than 5.

4,520,174

METHOD OF MAKING HEAT-RESISTANT POLYESTER

Yoshihiro Arai, Joyo, and Takumi Tanaka, Uji, both of Japan, assignors to Unitika Ltd., Osaka, Japan

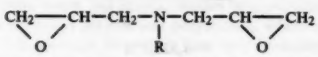
Filed Jun. 22, 1984, Ser. No. 623,062

Claims priority, application Japan, Jul. 8, 1983, 58-124912

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—438 4 Claims

1. In a method of making heat resistant polyester consisting of the reaction product of an aromatic dicarboxylic acid and a glycol containing 2 to 6 carbon atoms, the improvement comprising reacting the polyester with 0.1 to 5 weight percent of a bifunctional epoxy compound having the formula



wherein R is an organic group containing a benzene ring, so that the carboxyl end groups in the polyester are reduced to below about 15 g equivalents per 10^6 g of polymer.

4,520,175

METHOD OF MAKING HEAT-RESISTANT POLYESTER BY REACTING WITH A N,N,DIGLYCIDYL-ACIDAMIDE

Yoshihiro Arai, Joyo, and Takumi Tanaka, Uji, both of Japan, assignors to Unitika Ltd., Osaka, Japan

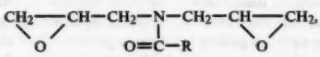
Filed Mar. 20, 1984, Ser. No. 591,642

Claims priority, application Japan, Apr. 14, 1983, 58-66439

Int. Cl.³ C08G *63/76*

U.S. Cl. 525—438 2 Claims

1. The method of making heat-resistant polyester comprising reacting the polyester with from about 0.1 to about 5 percent by weight of the polyester, of the bifunctional epoxy compound,



wherein R is a hydrocarbon or substituted hydrocarbon, to reduce the end carboxyl groups of the polyester to less than 15 g equivalents per 10^6 g of polyester polymer, wherein said polyester consists of an aromatic dicarboxylic acid reacted with a glycol having 2 to 6 carbon atoms.

4,520,176

TEXTILE FINISHING COMPOSITIONS

Eugene R. Martin, Onsted, Mich.; David S. Ansel, Sylvania, Ohio, and Paul A. Manis, Adrian, Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 430,187, Sep. 30, 1982, abandoned. This application Dec. 12, 1983, Ser. No. 560,348

Int. Cl.³ C08L *61/28*

U.S. Cl. 524—598 15 Claims

1. A textile finishing composition comprising (1) a diluent and (2) a durable press resin composition containing (a) an aminoplast resin and (b) an aldehyde in excess of that present in the aminoplast resin in which the durable press resin composition is present in an amount of at least 0.18 percent by weight based on the weight of the diluent and aminoplast resin and the weight ratio of aldehyde to aminoplast resin is from 0.05 to 0.6.

4,520,177

POLYMERIZATION OF CONJUGATED DIENES

Derek K. Jenkins, 7, Lakewood Rd., Ashurst, Southampton, England

Filed May 22, 1984, Ser. No. 612,801

Claims priority, application United Kingdom, May 24, 1983, 8314382

Int. Cl.³ C08F *4/12*

U.S. Cl. 526—151 21 Claims

1. A process for the polymerisation of one or more conjugated diene monomers as the sole polymerizable monomers by means of a catalyst comprising

(a) a salt of a rare earth element or a complex of a rare earth element;

(b) an organo magnesium compound and

(c) a Lewis acid

wherein the catalyst is formed by mixing component (a) with component (c) before contact with component (b).

4,520,178

PROCESS FOR PRODUCING WATER-INSOLUBLE POLYMERS OF UNIFORM SHAPE FROM GELLED SALTS OF ALGINIC ACID

Ko Sakata, Kawasaki, and Hirosuke Imai, Yokohama, both of Japan, assignors to Nippon Oil Co. Ltd., Japan

Filed Jul. 15, 1982, Ser. No. 398,589

Claims priority, application Japan, Jul. 15, 1981, 56-109453; Sep. 14, 1981, 56-144013

Int. Cl.³ C08F *2/20*

U.S. Cl. 526—200 1 Claim

1. A process for producing a water-insoluble polymer of uniform shape, which comprises the steps of

(i) dissolving or partially suspending in water

(a) no more than 20% by weight, based on the aqueous solution or suspension, of a water-soluble salt of alginic acid,

(b) a hydrophilic, crosslinkable vinyl monomer having two or more radical-polymerizable vinyl groups per molecule, and

(c) a hydrophilic, radical-polymerizable vinyl monomer, the combined concentration of (b) and (c) not exceeding 50% by weight, based on the aqueous solution or suspension;

(ii) contacting the resulting aqueous solution or suspension with an aqueous gelling solution to gel the salt of alginic acid and thus form a water-insoluble gel of uniform shape; and

(iii) subjecting the gel to radical polymerization to produce a water-insoluble polymer.

4,520,179

PREPARATION OF VINYLPYRROLIDONE/VINYL ACETATE COPOLYMERS OF VARIOUS MOLECULAR WEIGHTS USING A SINGLE INITIATOR SYSTEM CONSISTING ESSENTIALLY OF T-BUTYLPEROXYPIVALATE

Eugene S. Barabas, Watchung, and James R. Cho, Oakland, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Sep. 20, 1982, Ser. No. 419,869

Int. Cl.³ C08F *218/08, 226/10*

U.S. Cl. 526—212 12 Claims

1. Process which comprises polymerizing a monomer mixture consisting essentially of N-vinylpyrrolidone and vinyl acetate monomers in a reaction zone in the presence of free radical initiator consisting essentially of t-Butylperoxypivalate to form vinylpyrrolidone/vinyl acetate copolymer.

2. Process according to claim 1 wherein the polymerization is carried out in solvent consisting essentially of water or isopropyl alcohol or sec. butyl alcohol or mixtures thereof.

4,520,180

POLYMERIZATION OF VINYLPYRROLIDONE TO VARIOUS MOLECULAR WEIGHTS USING A SINGLE INITIATOR SYSTEM CONSISTING ESSENTIALLY OF T-BUTYLPEROXYPIVALATE

Eugene S. Barabas, Watchung, and James R. Cho, Oakland, both of N.J., assignors to GAF Corporation, Wayne, N.J.

Filed Sep. 20, 1982, Ser. No. 419,870

Int. Cl.³ C08F *118/08, 126/10*

U.S. Cl. 526—212 12 Claims

1. Process for making polyvinylpyrrolidone homopolymer which comprises polymerizing N-vinylpyrrolidone monomer in a reaction zone in the presence of free radical initiator consisting essentially of t-Butylperoxypivalate.

2. Process according to claim 1 wherein the polymerization is carried out in solvent consisting essentially of water or isopropyl alcohol or sec. butyl alcohol or mixtures thereof.

4,520,181

METHOD FOR MAKING A DICYCLOPENTADIENE THERMOSET POLYMER CONTAINIG ELASTOMER

Daniel W. Klosiewicz, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 342,453, Jan. 25, 1982, Pat. No. 4,400,340. This application Mar. 7, 1983, Ser. No. 472,684

Int. Cl.³ C08F *2/00, 4/78*

U.S. Cl. 525—247 2 Claims

1. A method of making a thermoset homopolymer comprising:

(a) combining a plurality of reactant streams, one of said streams containing an activator of a metathesis-catalyst system, and another of said streams containing a catalyst of a metathesiscatalyst system, at least one of said streams containing dicyclopentadiene, at least one of said streams containing elastomer, whereby a reaction mixture is formed, said elastomer being sufficient in amount to make the viscosity of said reaction mixture between about 300 and about 1000 centipoises;

(b) immediately injecting said reaction mixture into a mold where polymerization occurs, forming a thermoset dicyclopentadiene homopolymer containing elastomer.

4,520,182

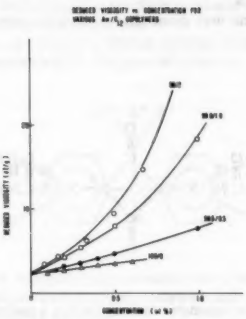
ACRYLAMIDE-ALKYLACRYLAMIDE COPOLYMERS

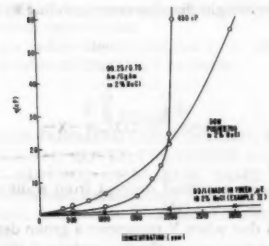
S. Richard Turner, Rochester, N.Y.; Donald B. Siano, Fanwood, and Jan Bock, Bridgewater, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 454,239, Dec. 29, 1982, abandoned, and a continuation-in-part of Ser. No. 454,290, Dec. 29, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 526,991

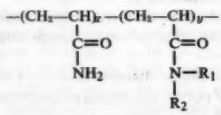
Int. Cl.³ C08F *20/56*

U.S. Cl. 526—307.2 **10 Claims**





1. A copolymer having the formula:



wherein R_1 having about 6 to 22 carbon atoms, is an alkyl group, straight chained or branched or cycloalkyl group, R_2 is the same or different alkyl group as R_1 or hydrogen, x is about 90.0 to about 99.9 mole %, and y is about 10 to about 0.1 mole %, wherein the intrinsic viscosity of said copolymer is about 1 to about 10 dl/g.

4,520,183

PROCESS FOR MAKING RANDOM ETHYLENE/ALKYL ACRYLATE COPOLYMERS

Narayanan S. Subramanian, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 22, 1982, Ser. No. 452,283

Int. Cl.³ C08F *210/02*

U.S. Cl. 526—318 **20 Claims**

11. An elastomeric copolymer derived from the addition polymerization in the presence of free radical initiator of component monomers consisting essentially of:

(a) 40–62 weight percent of a monomer selected from the group consisting of methyl acrylate and ethyl acrylate,

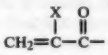
(b) 0.1–10.0 weight percent of a monoalkyl ester of 1,4-butenedioic acid, where the alkyl group has 1–6 carbon atoms,

(c) 0.1–5.0 weight percent of a polyfunctional monomer selected from the group consisting of:

(1) allyl and vinyl esters of C_2–C_{20} alkanoic, C_4–C_{20} alkenoic, C_8–C_{14} aromatic and C_9–C_{20} aralkanoic polycarboxylic acids, where the polycarboxylic acid is an acid having at least two —COOH groups, provided that at least two of the —COOH groups have been esterified,

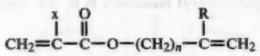
(2) N-allyl and N-vinyl amides of C_2–C_{20} alkanoic, C_4–C_{20} alkenoic, C_8–C_{14} aromatic and C_9–C_{20} aralkanoic polycarboxylic acids, where the polycarboxylic acid is an acid having at least two —COOH groups, provided that at least two of the —COOH groups have been amidated,

(3) acrylic esters and acrylic amides of C_2–C_{20} alkyl, aryl and arylalkyl polyols and polyamines, where the polyols are alcohols having at least two hydroxyl groups and the polyamines are amines having at least two amine groups, provided that at least two of the hydroxyl groups have been esterified and at least two of the amine groups have been amidated with an acrylic group of the formula



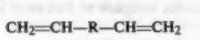
where X is H, C_1–C_{10} alkyl, C_6–C_{10} aryl, C_6–C_{10} aralkyl, F, Cl, or Br,

(4) an olefin-acrylate of the formula

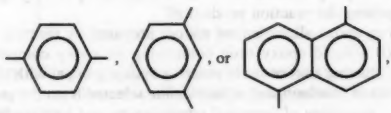


where x=H or CH_3, n=0 or 1, R is H or C_6–C_{20} aryl, and

(5) a diolefin of the formula



where R is



(d) 23.0–59.8 weight percent of ethylene.

4,520,184

POLYETHERENE-POLYACRYLIC POLYMERIZABLE COMPOSITIONS

Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jun. 3, 1983, Ser. No. 500,700

The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.

Int. Cl.³ C08F *220/32*

U.S. Cl. 526—320 **31 Claims**

1. A composition of matter comprising:

A. a polyetherene represented by the structure:

$$R_1\text{-}(E)_m\text{-}R_2]_n$$

where R_1 is a radical of molecular weight less than about 2000 obtained by removal of active hydrogen from an active hydrogen compound selected from the group consisting of water, alcohols, thiols, carboxylic acids, carboxylic amides and amines, where the functionality of R_1 is n and is in the range of 1 to 10, where the E units are represented by the structure

$$\begin{array}{l} CH_2\text{—}CH\text{—}O \\ \quad\quad | \\ CH_2\text{—}O\text{—}CH_2\text{—}CH{=}CH_2 \end{array}$$

and are derived from allyl glycidyl ether, where R_2 is selected from the group consisting of hydrogen and C_2 to C_{10} organic radicals, where the product of m and n is at least 4 and not more than about 60 and where the allyloxy equivalent of the polyetherene is less than about 250;

B. a non-air-curing polyacrylyl monomer represented by the structure:

$$(CH_2{=}\underset{\displaystyle R_3}{\underset{|}{C}}\text{—}\overset{\displaystyle O}{\overset{\|}{C}}\text{-}\!\!\rightarrow_p R_4$$

where R_3 is selected from the group consisting of H, methyl or ethyl, p is an integer in the range of 2 to 10, and R_4 is the residue of a polyol, a polycarboxylic acid, a polyamine, a polyepoxide or a polyisocyanate of molecular weight less than about 2000, containing a hydrocarbon, polyester, polyamide, polyether or polyurethane backbone; and

C. a metallic drier: wherein the weight ratio of polyetherene to non-air-curing polyacrylyl monomer is in the range of from 1:19 to 1:1.

4,520,185

ALKANOLAMINE LINKED EPOXY-URETHANES

Douglas J. Tosh, Brantford, Canada, assignor to Sternson Limited, Brantford, Canada

Filed Aug. 31, 1984, Ser. No. 646,702
Int. Cl.³ C08G *18/32*
U.S. Cl. 528—65 **16 Claims**

1. An epoxy-urethane curable with an epoxy curing agent, comprising the reaction product of

(a) an epoxy-alkanolamine adduct prepared by reacting

(i) a liquid epoxy resin comprising an epoxy compound having two or more reactive epoxy groups, with

(ii) an N-substituted ethanolamine selected from the group consisting of isopropyl ethanolamine and teritiary butyl ethanolamine

in a ratio providing an excess of epoxide equivalents from the epoxy resin over amine equivalents of the ethanolamine, and

(b) a urethane prepolymer of the kind formed by the condensation of low molecular weight, hydroxyl-terminated alkyl polyesters or polyethers with an aromatic di-isocyanate to produce a liquid, isocyanate-terminated polyurethane prepolymer,

the relative quantities of said urethane prepolymer and of said epoxy-alkanolamine adduct reacted together being such that the number of hydroxyl equivalenets from said ethanolamine is approximately equal to or greater than the number of isocyanate equivalents from said urethane prepolymer, so that substantially no residual isocyanate functionality remains in the reaction product.

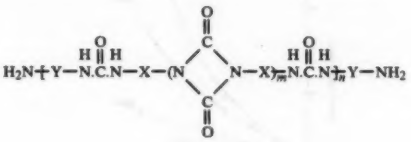
4,520,186

POLYURETHANES AND POLYURETHANE-UREAS BASED ON AROMATIC URET DIONE DIAMINE ADDUCTS

Heinrich Hess; Gerhard Grögler, both of Leverkusen, and Richard Kopp, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,245
Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232736
Int. Cl.³ C08G *18/32, 18/77;* C07D *1/00*
U.S. Cl. 528—73 **13 Claims**

1. An aromatic uret dione diurea diamine corresponding to the formula



in which

X represents an aromatic radical having a molecular weight of from 76 to 499,

Y represents an aromatic radical having a molecular weight of from 76 to 10,000 or a radical derived from a high molecular weight diamine corresponding to the formula

in which

Z represents a radical derived from a dihydroxy compound HO—Z—OH,

provided that when Y represents a group derived from a diamine having a molecular weight ≧500 X does not represent a 2,4-diphenyl sulfide radical,

m represents a number of from 1 to 10 and

n represents a number of from 1 to 3.

9. A process for the production of urea-group-containing high molecular weight polyaddition products comprising reacting

(a) the aromatic uret dione diurea diamine of claim 1 with

(b) an NCO-prepolymer of polyol and excess polyisocyanate and/or a polyisocyanate

at a temperature greater than 100° C. in quantities such that the equivalent ratio of NCO-groups to the sum of OH- and NH_2-groups is from 0.9 to 1.4.

13. A self-crosslinking one component system at temperatures above 140° C. comprising the reaction product of a (i) long chain diamine $H_2N\text{—}Y\text{—}NH_2$ having a molecular weight of at least 500 where Y represents a radical corresponding to the formula

in which

Z represents a radical derived from a dihydroxy compound HO—Z—OH

with (ii) a uret dione diisocyanate.

4,520,187

POLYCARBONATES AND POLYESTER CARBONATES EXHIBITING IMPROVED HEAT RESISTANCE

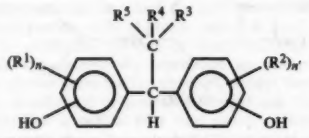
Victor Mark, Evansville, and Charles V. Hedges, Mt. Vernon, both of Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 17, 1982, Ser. No. 451,109
Int. Cl.³ C08G 63/62, 63/64
U.S. Cl. 528—176 40 Claims

1. Thermoplastic polymeric compositions exhibiting improved heat resistance comprised of (i) at least one thermoplastic polymer containing the reaction products of:

(a) a carbonate precursor; and

(b) at least one dihydric phenol selected from dihydric phenols represented by the general formula



wherein

each R^1 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals,

each R^2 is independently selected from halogen radicals, monovalent hydrocarbon radicals, and monovalent hydrocarbonoxy radicals,

R^3, R^4 and R^5 are independently selected from monovalent hydrocarbon radicals, and

n and n′ are independently selected from whole numbers having a value of from 0 to 4 inclusive.

4,520,188

POLYESTER-FORMING COMPOSITION FOR COIL COATINGS, IMPROVED POLYESTER RESIN AND METHOD OF MAKING SAME

Edward J. Holzrichter, Redlands, and Marc L. Smith, Highland, both of Calif., assignors to Whittaker Corporation, Los Angeles, Calif.

Filed Sep. 13, 1984, Ser. No. 650,156
Int. Cl.³ C08G 63/04, 63/22
U.S. Cl. 528—274 13 Claims

1. An improved polyester-forming composition for coil coatings, said composition comprising:

about 43–31 mole % of neopentyl glycol;

about 10–21 mole % of 1,4-cyclohexanedimethanol;

about 10–21 mole % of aliphatic dicarboxylic acid selected from the group consisting of adipic acid, sebacic acid, azelaic acid, dodecanedioic acid and mixtures thereof;

about 22–16 mole % of aromatic acid selected from the group consisting of orthophthalic acid, isophthalic acid and mixtures thereof;

about 15–11 mole % of terephthalic acid; and, sufficient condensation catalyst to effect substantial esterification and polymerization of said composition at elevated temperature.

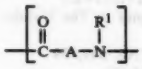
4,520,189

OPTICAL DEVICE INCLUDING BIREFRINGENT AROMATIC AMINO CARBOXYLIC ACID POLYMER

Howard G. Rogers, Weston; Ruth C. Bilofsky, Lexington, both of Mass.; Russell A. Gaudiana, Merrimack, N.H., and Ronald A. Sahatjian, Lexington, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

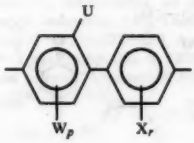
Division of Ser. No. 238,054, Mar. 2, 1981, Pat. No. 4,446,305. This application Apr. 18, 1984, Ser. No. 601,619
Int. Cl.³ C08G 69/12
U.S. Cl. 528—331 11 Claims

1. An optical device including a transparent molecularly oriented highly birefringent polymer, said highly birefringent polymer comprising repeating molecular units exhibiting high electron density substantially cylindrically distributed about the long axes of the polymer and the repeating units thereof, said highly birefringent polymer being substantially optically uniaxial exhibiting only two indices of refraction, said molecularly oriented highly birefringent polymer comprising recurring units of the formula



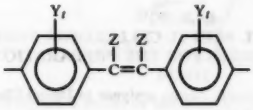
wherein R^1 is hydrogen, alkyl, aryl, alkaryl or aralkyl, and A is a divalent radical selected from the group consisting of

(1) a radical



where U is a substituent other than hydrogen, each W is hydrogen or a substituent other than hydrogen, p is an integer from 1 to 3, each X is hydrogen or a substituent other than hydrogen and r is an integer from 1 to 4, said U, W_p and X_r substitution being sufficient to provide said radical with a non-coplanar molecular configuration; and

(2) a radical



where each of Y and Z is hydrogen or a substituent other than hydrogen and each t is an integer from 1 to 4, with the proviso that when each said Z is hydrogen, at least one said Y substituent is a substituent other than hydrogen positioned on the corresponding nucleus ortho with respect to the

moiety of said radical, said Z and Y_t substitution being sufficient to provide said radical with a non-coplanar molecular configuration.

4,520,190

PREPARATION OF POLYAMIDE FROM DINITRILE, DIAMINE AND WATER WITH P CATALYST

Gerald P. Coffey, Lyndhurst; Benedict S. Curatolo, Maple Heights, and Rimvydas L. Cepulis, Euclid, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 439,975, Nov. 8, 1982, abandoned, which is a continuation-in-part of Ser. No. 370,228, Apr. 20, 1982, abandoned, which is a continuation of Ser. No. 335,905, Dec. 30, 1981, abandoned. This application Sep. 19, 1983, Ser. No. 533,479
Int. Cl.³ C08G 69/00
U.S. Cl. 528—336 18 Claims

1. A process for producing a fiber forming polyamide comprising contacting a dinitrile, water and a diamine wherein

(A) the diamine is added gradually to the nitrile during the course of polymerization;
(B) the dinitrile, water and diamine are contacted with an oxygenated phosphorus compound catalyst; and
(C) no ammonia is added to the reactants and the only ammonia which is present during polymerization is that which is generated in situ.

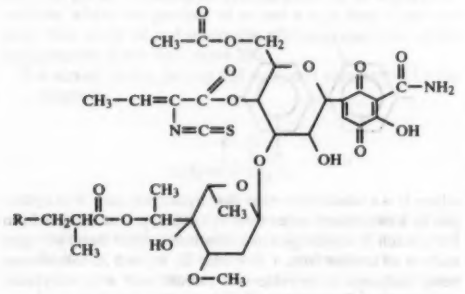
4,520,191

PAULOMYCIN DERIVATIVES

Paul F. Wiley, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 8, 1983, Ser. No. 549,939
Int. Cl.³ C07H *15/22*
U.S. Cl. 536—17.9 **4 Claims**

1. A compound of the formula



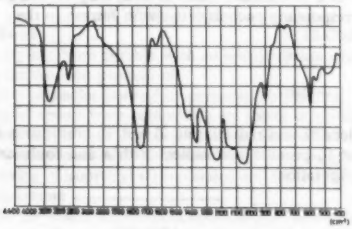
wherein R is H or CH_3.

4,520,192

CARBOXYALKYL ACETYL CELLULOSES, THEIR SALTS AND A PROCESS FOR THE PREPARATION OF THEM

Hajime Namikoshi, Himeji, Japan, assignor to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Jul. 3, 1984, Ser. No. 627,418
Int. Cl.³ C08B *13/00*
U.S. Cl. 536—66 **7 Claims**



1. A process for the preparation of carboxyalkyl acetyl cellulose having a degree of substitution (DS) by the carboxyalkyl group per anhydroglucose unit of 0.2–2.5 and a degree of substitution (DS) by the acetyl group per anhydroglucose unit of 0.5–2.8 and a salt thereof, the alkyl in the carboxyalkyl group being a C_{1-3} alkyl, comprising converting an alkali metal salt of a carboxyalkyl cellulose having a degree of substitution by the carboxyalkyl group per anhydroglucose unit of 0.2–2.5 into its acid-form by treatment with an aqueous acid solution, and then acetylating the acid-form of the carboxyalkyl cellulose with acetic anhydride in the presence of a catalyst at 40°–60° C.

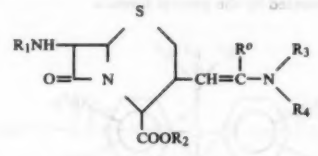
4,520,193

CEPHALOSPORIN DERIVATIVES

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Claude Moutonnier, Le Plessis Robinson, and Gerard Wolff, Thiais, all of France, assignors to Rhone-Poulenc Industries, Paris, France

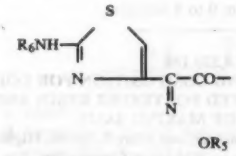
Filed Nov. 19, 1981, Ser. No. 322,961
Claims priority, application France, Nov. 20, 1980, 80 24638
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C07D *501/38*; A61K *31/545*
U.S. Cl. 544—016 **13 Claims**

1. A cephalosporin derivative of the formula:

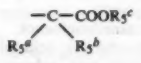


which is in the form of a bicyclooct-2-ene or bicyclooct-3-ene, in which formula the symbols R_3 and R_4, which are identical or different, represent alkyl (unsubstituted or substituted by alkoxy or dialkylamino) or phenyl, or together form, with the nitrogen atom to which they are attached, a 5- or 6-membered saturated heterocyclic ring or a said ring having another hetero-atom chosen from nitrogen, oxygen and sulphur, and unsubstituted or substituted by alkyl,

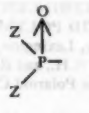
(a) the symbol R_1 represents a radical of the formula:



[[in which R_5 is hydrogen, alkyl, vinyl or cyanomethyl, an oxime-protecting group chosen from trityl, tetrahydropyranyl and 2-methoxy-prop-2-yl or a radical of the formula:



(in which R^a_5 and R^b_5, which are identical or different, are hydrogen or alkyl, or together form an alkylene having 2 or 3 carbon atoms, and R^c_5 is an acid-protecting radical chosen from methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl or p-methoxybenzyl) and R_6 is an amino-protecting radical chosen from t-butoxycarbonyl, trityl, benzyl, dibenzyl, benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, p-methoxybenzyloxycarbonyl or a radical of the formula:



in which the symbols Z represent phenyl or radicals —OZ', in which Z' represents an alkyl, 2,2,2-trichloroethyl, phenyl or benzyl (it being possible for the said phenyl or benzyl to be substituted by an alkyl, alkoxy or

nitro), or alternatively the symbols Z' of the two substituents Z together form an alkylene having 2 or 3 carbon atoms]], benzhydryl or trityl, an acyl radical of the formula:

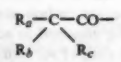
R_7CO—

[[in which R_7 is alkyl substituted by phenyl or phenoxy]], a radical of the formula:

R_8OCO—

[[in which R_8 is an unsubstituted branched alkyl or a linear or branched alkyl carrying one or more substituents [chosen from amongst phenyl and phenyl substituted by alkoxy, nitro or phenyl] or vinyl, or a radical $Z_2P(O)$— as hereinbefore defined, or alternatively R_1NH is replaced by methyleneamino in which the methylene is substituted by a dialkylamino or aryl group (which is itself unsubstituted or substituted by one or more methoxy or nitro groups), the symbol R_2 represents an acid-protecting radical chosen from methoxymethyl, t-butyl, benzhydryl, benzyl, nitrobenzyl or p-methoxybenzyl and the symbol R° represents a radical of a first group consisting of a phenyl unsubstituted or substituted by an alkyl, trifluoromethyl, dialkylaminomethyl, alkoxy, alkylthio or dialkylamino or by a halogen atom selected from fluorine or chlorine, or a 5- or 6-membered heterocyclic radical having a single hetero-atom, selected from pyrid-2-yl or pyrid-3-yl, thien-2-yl or thien-3-yl or furan-2-yl or furan-3-yl, and which is unsubstituted or substituted by alkyl, alkoxy or dimethylaminomethyl, or a radical of a second group designated as a radical $—CHR_9R_{10}$ consisting of an alkyl having 1 to 5 carbon atoms, benzyl substituted or substituted by a halogen atom or an alkyl, alkoxy, alkylthio, dialkylamino or trifluoromethyl, a methyl substituted by a 5- or 6-membered aromatic heterocyclic ring selected from pyrid-2-yl or pyrid-3-yl, thien-2-yl or thien-3-yl or furan-2-yl or furan-3-yl, a cycloalkyl having 3 to 6 ring members, or a radical $—CHR_9R_{10}$ in which R_9 and R_{10}, together with the carbon atom to which they are attached, form a 5- or 6-membered heterocyclic ring having an oxygen or sulphur atom, or alternatively

(b) the symbol R_1 represents trityl or silyl, alkoxycarbonyl, the alkyl part of which has 1 to 5 carbon atoms, and which is unsubstituted or substituted by one or more phenyls or furyls, 2-(biphenyl-4-yl)-propoxycarbonyl, or a radical of the formula:



in which R_a is an unsubstituted or substituted phenyl, thienyl, furyl, cyclohexadienyl or cyclohexenyl, R_b is a hydrogen atom and R_c is a hydrogen atom, an optionally protected hydroxyl, a protected amino or an optionally protected sulpho, or R_a is an unsubstituted or substituted phenoxy or a pyridylthio and R_b and R_c are hydrogen atoms, or alternatively R_a is phenyl, thienyl or furyl and R_b and R_c together form an alkoxyimino, cycloalkoxyimino or phenylalkoxyimino in the syn form, the symbol R_2 represents an acid-protective radical chosen from a phenyl group polysubstituted by aliphatic or aromatic radicals, an aromatic heterocyclic group having an oxygen or sulphur ring member, a t-alkyl, unsubstituted or substituted diphenylmethyl, alkoxyphenylalkyl, dimethoxybenzyl, nitrobenzyl, 4,5-dimethoxy-2-nitrobenzyl or furfuryl group, or a 2-oxa(or 2-thia)-cycloalkyl or 2-oxa(or 2-thia)-cycloalkenyl group having 5 to 7 ring members, or a nitrophenyl or 2,4-dinitrophenyl group, or silyl substituted by alkoxy, cycloalkyl, phenyl or phenylalkyl, and the symbol R° represents an alkyl (having 1 to 7 carbon atoms), a cycloalkyl (having 3 to 7 carbon atoms), a cycloalkyl-alkyl (having 4 to 7 carbon atoms), a phenyl or naphthyl radical, a phenylalkyl radical or a 5- or 6-membered heterocyclic radical having 1 to 4 hetero-atoms chosen from amongst nitrogen, oxygen or sulphur, or 5- or 6-membered heterocyclylalkyl radical in which the heterocyclic moiety has 1 to 4 heteroatoms chosen from amongst nitrogen, oxygen or sulphur, it being possible for these radicals R° to be unsubstituted or substituted by alkyl or alkoxy, and it being understood that (unless otherwise mentioned) the alkyl or acyl portions or radicals are linear or branched and have 1 to 4 carbon atoms.

4,520,194

CEPHALOSPORINS

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

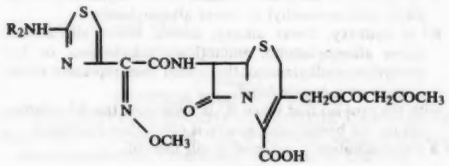
Division of Ser. No. 787,258, Apr. 13, 1977, abandoned. This application Jul. 6, 1978, Ser. No. 922,423

Claims priority, application Japan, Apr. 14, 1976, 51-42885; Sep. 8, 1976, 51-108102

Int. Cl.³ C07D *501/34*

U.S. Cl. 544—22 **6 Claims**

1. A member selected from the group consisting of a 7-[2-(2-aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]caphalosporin compound of the formula:



wherein R_2NH is amino or amino protected by a conventional protecting group, and a pharmaceutically acceptable salt or ester thereof.

4,520,195

5-OXO-AS-TRIAZINES

Roland Reiner, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

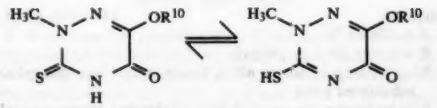
Division of Ser. No. 306,053, Sep. 28, 1981, Pat. No. 4,412,070. This application Aug. 1, 1983, Ser. No. 519,453

Claims priority, application Switzerland, Oct. 6, 1980, 7450/80

Int. Cl.³ C07D *253/06*

U.S. Cl. 544—182 **2 Claims**

1. A compound of the tautomeric formulae



wherein R^{10} with the oxygen atom is selected from the group consisting of a lower alkanoyloxyalky, lower alkoxycarbonyloxyalkyl, lactonyl, lower alkoxymethyl or lower alkanoylaminomethyl ether group.

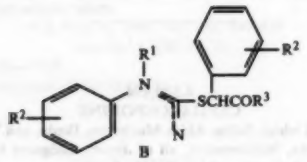
4,520,196

α-MERCAPTOPHENYLACETIC ACID DERIVATIVES OF IMIDAZOLE-CONTAINING COMPOUNDS AND ANALOGUES THEREOF

Peter H. L. Wei, Springfield, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Aug. 18, 1983, Ser. No. 524,479
Int. Cl.³ C07D *239/95, 235/28*
U.S. Cl. 544—285 **9 Claims**

1. A compound having the formula:



wherein

B represents a single bond or the moiety

R^1 is hydrogen, lower alkyl or phenyl;

R^2 is hydrogen, halo, nitro, amino, lower alkylamino, lower alkyl, trifluoromethyl or lower alkanoylamino;

R^3 is hydroxy, lower alkoxy, amino, lower alkylamino, lower alkanoylamino, amino(lower)alkylamino, or hydroxy(lower)alkylamino; the dotted lines represent either a single or a double bond;

with the proviso that when R^1 is hydrogen, the R^2 substituent on the benzofused moiety is other than hydrogen;

or a pharmaceutically acceptable salt thereof.

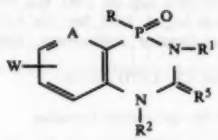
4,520,197

TETRAHYDROBENZODIAZAPHOSPHORINDIONES AND TETRAHYDROPYRIDODIAZAPHOSPHORINDIONES

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 379,584, May 19, 1982, Pat. No. 4,433,129, and a continuation-in-part of Ser. No. 296,031, Aug. 25, 1981, abandoned. This application Feb. 1, 1984, Ser. No. 575,740
Int. Cl.³ C07F *9/58, 9/36*
U.S. Cl. 546—21 **7 Claims**

1. A compound of the following formula (A):



(A)

wherein,

A is CH or N;

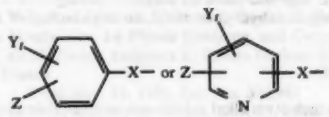
R is lower alkyl or phenyl;

R^1 is hydrogen, lower alkyl, lower cycloalkyl, phenyl or substituted phenyl;

R^2 is hydrogen, lower alkyl, lower haloalkyl, lower cyanoalkyl or lower alkoxyalkyl;

R^5 is oxygen or sulfur; and

W is hydrogen, lower alkyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, halogen or the group



where X is oxygen, sulfur, sulfinyl or sulfonyl; t is zero, one or two; and Y and Z is independently selected from hydrogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy or halogen.

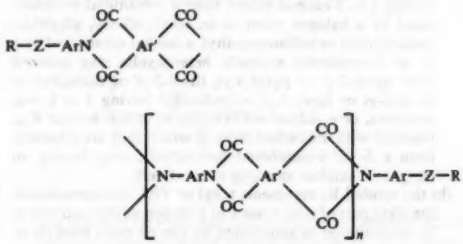
4,520,198

VINYLACETYLENE-TERMINATED POLYIMIDE DERIVATIVES

Gaetano F. D'Alelio, deceased, late of South Bend, Ind. (by St. Joseph Bank and Trust Company, executor), and Phillip A. Waitkus, Sheboygan, Wis., assignors to Plastics Engineering Company, Sheboygan, Wis.

Division of Ser. No. 353,871, Mar. 2, 1982, Pat. No. 4,435,323, and a continuation-in-part of Ser. No. 199,616, Oct. 22, 1980, abandoned. This application Dec. 27, 1983, Ser. No. 565,393
Int. Cl.³ C07D *209/34, 471/00*; C08F *22/40*
U.S. Cl. 546—66 **24 Claims**

1. The Diels-Alder addition product of a polyimide of the formula:



wherein:

Ar′ is a tetravalent aromatic radical, the four carbonyl groups being attached directly to separate carbon atoms and each pair of carbonyl groups being attached to adjacent carbon atoms in Ar′ except in the case of Ar′ being a naphthlaene radical, one or both pairs of the carbonyl groups may be attached to peri-carbon atoms;

Ar is a divalent aromatic radical;

n is zero or an integer having a value of one to 20;

R is hydrogen or an organic moiety containing 1 to 21 carbon atoms;

Z is the structure —CH=CH—C≡C— or —C≡C—CH=CH—;

and a dienophile of the formula:

$$C_6H_5—C≡C—C≡C—C_6H_5$$

or

$$Ar—CH=CH—C≡C—Ar$$

wherein the Ar in the dienophile is a monovalent aromatic radical, the addition being between the enyne groups of the said polyimide, between the enyne groups of the polyimide and the —C≡C—C≡C or the —CH=CH—C≡C— of the dienophile, and to a minor extent between the said enyne of the polyimide and any other unsaturation in an R group.

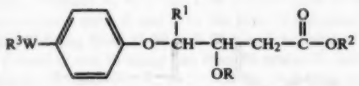
4,520,199

ALKOXY SUBSTITUTED PHENOXY ALKANOIC ACID ESTERS

Gustave K. Kohn, Palo Alto, and Joe T. Bamberg, Redwood City, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

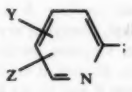
Filed Aug. 13, 1982, Ser. No. 407,685
The portion of the term of this patent subsequent to Nov. 20, 2001, has been disclaimed.
Int. Cl.³ C07D *213/64*; A01N *43/40*
U.S. Cl. 546—302 6 Claims

1. A compound of the following formula (A):



(A)

wherein,
R is lower alkyl;
R^1 is methyl;
R^2 is lower alkyl, lower alkenyl or lower alkynyl;
W is oxygen; and
R^3 is



in which,
each of Y and Z is independently selected from hydrogen, trifluoromethyl, bromo, chloro, fluoro and nitro.

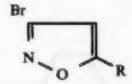
4,520,200

ISOXAZOLE DERIVATIVES

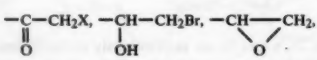
Davide Della Bella, and Dario Chiarino, both of Milan, Italy, assignors to Zambon S.p.A., Milan, Italy

Division of Ser. No. 104,740, Dec. 18, 1979, Pat. No. 4,276,299. This application Aug. 22, 1980, Ser. No. 180,422
Claims priority, application Italy, Dec. 22, 1978, 31198 A/78
Int. Cl.³ C07D *261/10*
U.S. Cl. 548—247 5 Claims

1. A compound having the formula:



wherein R is selected from the group consisting of



and X is selected from the group consisting of hydrogen and bromine.

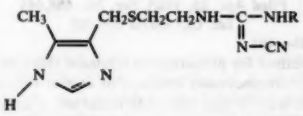
4,520,201

SYNTHESIS OF CIMETIDINE AND ANALOGS THEREOF

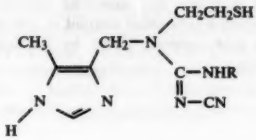
Michitaro Fujimoto, Tondabayashi; Hironori Ohde, Habikino; Hirokazu Seki, Nara; Shuhei Takamatsu, Sakai, and Takeshi Sakai, Nara, all of Japan, assignors to Fujimoto Pharmaceutical Corp., Japan

Filed Jun. 27, 1983, Ser. No. 508,182
Claims priority, application Japan, Aug. 19, 1982, 57-143568
Int. Cl.³ C07D *233/64*
U.S. Cl. 548—342 10 Claims

1. A process for producing a cyanoguanidine derivative of the formula:



wherein R is lower alkyl of 1–5 carbon atoms which comprises heating an alkali metal salt of a compound of the formula:



at between 40° and 100° C.

4,520,202

PROCESS FOR PREPARING 4,4'-DIBENZOYLAMINODIANTHRIMIDE CARBAZOLE

Josef Stawitz, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 29, 1982, Ser. No. 445,292
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1981, 3148695
Int. Cl.³ C07D *209/80*
U.S. Cl. 548—416 8 Claims

1. Process for preparing 4,4'-dibenzoylaminoanthrimidecarbazole, characterised in that 4,4'-diaminodianthrimide is benzoylated and carbazolated, both steps being carried out in one-vessel fashion and the 4,4'-diaminodianthrimide having been obtained by oxidising a mixture of 1-aminoanthraquinone and 1,4-diaminoanthraquinone in a molar ratio of 0.9:1 to 1.4:1 in 40 to 60% strength H_2SO_4 and then reducing.

4,520,203

RESOLUTION OF (±)-1,8-DIETHYL-1,3,4,9-TETRAHYDROPYRANO[3,4-B]INDOLE-1-ACETIC ACID USING CINCHONINE

Nedumparambil A. Abraham, Dollard-des-Ormeaux, and Christopher A. Demerson, Montreal, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Aug. 16, 1983, Ser. No. 523,987
Int. Cl.³ C07D *493/04*
U.S. Cl. 548—432 3 Claims

1. A process for preparing (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid, which comprises dissolving one part by weight of (±)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid and about 1.1 to 1.3 parts by weight of cinchonine in about 40 to 60 parts by weight of methanol at about 50° to 65° C.; cooling the solution to crystallize the corresponding salt of (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid with cinchonine; dissolving the latter salt in a mixture of water-immiscible organic

solvent and an aqueous mineral acid; separating the water-immiscible organic solvent; and isolating substantially pure (+)-1,8-diethyl-1,3,4,9-tetrahydropyrano[3,4-b]indole-1-acetic acid from the water-immiscible organic solvent.

4,520,204

METHOD FOR PREPARATION OF AROMATIC ETHER IMIDES AND FOR CATALYST RECOVERY THEREIN

Thomas L. Evans, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 25, 1983, Ser. No. 488,461
Int. Cl.³ C07D *209/48*
U.S. Cl. 548—461 **13 Claims**

1. In a method for preparing an aromatic ether imide by the nucleophilic displacement reaction of at east one substituted phthalimide with at least one alkali metal salt of a hydroxyaromatic compound in an organic diluent in the presence of a phase transfer catalyst followed by aqueous extraction of the reaction mixture, the improvement which comprises: effecting said extraction with an aqueous phase containing a substantial proportion of inorganic salt dissolved therein, and subsequently recovering a substantial amount of said phase transfer catalyst from said aqueous phase by extraction with o-dichlorobenzene.

4,520,205

CHEMICAL RESOLUTION OF (+)-2,3-DIHYDROINDOLE-2-CARBOXYLIC ACID

George C. Buzby, Jr., Blue Bell, Pa., assignor to American Home Products Corporation, New York, N.Y.

Continuation of Ser. No. 392,916, Jun. 28, 1982, abandoned.
This application Feb. 10, 1984, Ser. No. 578,320
Int. Cl.³ C07D *209/12*
U.S. Cl. 548—491 **4 Claims**

1. A process for separating the optical enantiomers of (+)-2,3-dihydroindole-2-carboxylic acid which comprises:

(a) combining the (+)-2,3-dihydroindole-2-carboxylic acid with (+) or (−)-ephedrine as the resolving agent in a resolution solvent;

(b) crystallizing out and isolating from said solution the (+)-ephedrine (+)-acid salt or the (−)-ephedrine (−)-acid salt; and

(c) regenerating the (+) or (−)-acid from the crystallized salt.

4,520,206

PROCESS FOR PREPARING MALEIMIDE

Stephen S. Hupp, Dublin, Ohio, assignor to Ashland Oil, Inc., Ashland, Ky.

Filed Feb. 27, 1984, Ser. No. 583,924
Int. Cl.³ C07D *207/267*
U.S. Cl. 548—548 **4 Claims**

1. A process for the preparation of maleimide comprising subjecting a mixture of succinimide, air and water to oxidative dehydrogenation at a temperature in the range of from 300° to 550° C. over a catalyst having the formula $Cu_aP_bV_xMo_yO_z$ wherein a is 0.002 to 0.2, b is 0.01 to 1, x is 0.01 to 1, y is 1.2, and z is the value corresponding to average valances of the elements in the oxidation states in which they exist in the catalyst.

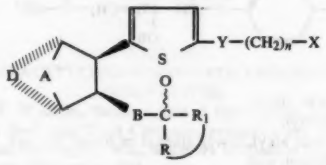
4,520,207

SYNTHESIS OF THIOPHENE-CONTAINING PROSTAGLANDIN ENDOPEROXIDE ANALOGS

Richard C. Larock, Ames, Iowa, assignor to Iowa State University Research Foundation, Inc., Ames, Iowa

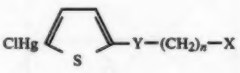
Filed Sep. 27, 1982, Ser. No. 423,789
The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.
Int. Cl.³ C07D *333/24*
U.S. Cl. 549—79 **6 Claims**

1. A method of forming thiophene-containing prostaglandin endoperoxide analogs of the formula:



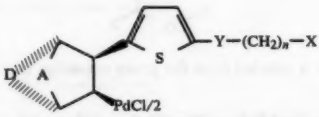
wherein n equals a whole integer of from 0 to 7, X is carboxylic acid, or C_1–C_8 ester, alcohol, ether or amide groups; Y is ethylene or cis or trans vinylene; A is methylene, ethylene, oxy, imino, or lower alkyl, phenyl or aryl substituted imino; D is methylene, ethylene, vinylene, methyleneoxy, alkylidenedioxy, iminooxy, dithio, or azo; B is ethylene, cis and trans vinylene, and ethynylene; R and R_1 are hydrogen, lower alkyl and lower aryl or $(CH_2)_Z$ with Z being 2 to 5, and Q is hydroxy, methoxy, acetoxy or hydrogen, or Q and R_1 are oxa, said method comprising:

reacting an organomercurial of the formula:



wherein X and Y are as previously defined, with a bicyclic olefin of the formula:

wherein A and D are as previously defined, in the presence of a lithium palladium chloride complex to provide a bicyclic alkyl palladium compound of the formula:



wherein A, D, n and X are as previously defined; and displacing the palladium moiety of said alkyl palladium compound with a protected lithium acetylide to provide said thiophene-containing endoperoxide analog.

4,520,208

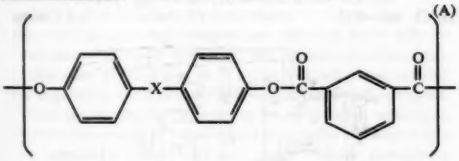
AROMATIC POLYESTER CONTAINING PHENOLPHTHALEIN UNIT AND BIS-PHENOL UNIT

Masahiro Hayashi, Machidashi; Seiichi Nozawa, Yamato, and Takashi Oikawa, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,494
Int. Cl.³ C07D 307/78
U.S. Cl. 549—308 6 Claims

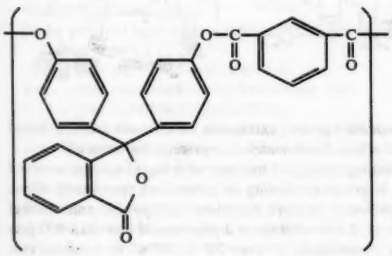
1. An aromatic polyester comprising two structural units represented by the following formulas A and B in a molar ratio of the structural unit A to the structural unit B being from 70:30 to 90:10 or four structural units represented by the following formulas A, B, C and D in a molar ratio of the total of the structural units A and C to the total of the structural units B and D being from 10:90 to B 95:5 and the total of the structural units C and D being less than 50 molar %, and having a reduced viscosity η sp/C of from 0.6 to 4 dl/g as measured at 30° C. at a concentration of 1.0 g/dl in a solution of a mixture comprising phenol and tetrachloroethane in a weight ratio of 1:1,

Structural unit A:



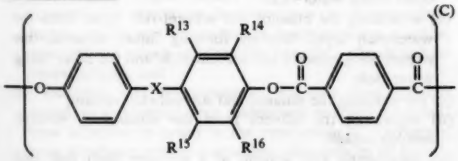
(A)

Structural unit B:



(B)

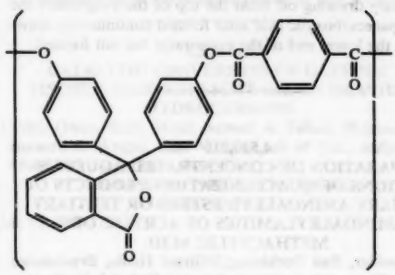
Structural unit C:



(C)

Structural unit D:

-continued



(D)

wherein the bisphenol component of structural units A and C is selected from the group consisting of 2,2-bis(4-hydroxyphenyl)propane, 2,2'-bis(4-hydroxy-3,5-dimethylphenyl)propane, 2,2'-bis(4-hydroxy-3,5-dichlorophenyl)propane, 2,2-bis(4-hydroxy-3-methylphenyl)propane, 2-2-bis(4-hydroxy-3-chlorophenyl)-propane, bis(4-hydroxyphenyl)-methane, bis(4-hydroxy-3,5-dimethylphenyl)-methane, bis(4-hydroxy-3,5-dichlorophenyl)-methane, bis(4-hydroxy-3,5-dibromophenyl)-methane, 1,1-bis(4-hydroxyphenyl)cyclohexane, 4,4'-dihydroxydiphenyl-bis(hydroxyphenyl)-ketone, bis(4-hydroxy-3,5-dimethylphenyl)-ketone, bis(4-hydroxy-3,5-dichlorophenyl)-ketone, bis(4-hydroxyphenyl)sulfide, bis(4-hydroxy-3-chlorophenyl)-sulfide, bis(4-hydroxy-3,5-dichlorophenyl)-sulfide, bis(4-hydroxyphenyl)-sulfone, and bis(4-hydroxy-3,5-dichlorophenyl)ether.

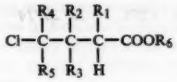
4,520,209

PROCESS FOR CYCLIZING UPSILON-CHLOROCARBOXYLIC ACIDS

Werner Schwarze, Frankfurt; Axel Kleemann, Hanau; Hans Remmel, Freigericht, and Wolfgang Hohn, Gründau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

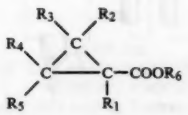
Continuation of Ser. No. 195,832, Oct. 10, 1980, abandoned.
This application Jun. 28, 1984, Ser. No. 625,188
Claims priority, application Fed. Rep. of Germany, Oct. 11, 1979, 2941211
Int. Cl.³ C07C 69/74
U.S. Cl. 560—124 10 Claims

1. A process for the cyclization of a α-chlorocarboxylic acid ester of the formula



(I)

where each of R_1 to R_5 is hydrogen or the methyl group and R_6 is methyl or ethyl to cyclopropanecarboxylic acid ester of the formula



(II)

comprising carrying out the reaction employing as condensation agent sodium or potassium methylate and as solvent methyl alcohol or employing as condensation agent sodium or potassium ethylate and as solvent ethyl alcohol at a temperature above the boiling temperature of the alcohol used and between 90° and 200° C., said process including the steps of continuously feeding the reactants to a thin layer evaporator

and continuously evaporating them in the evaporator and continuously drawing off from the top of the evaporator the cyclopropanecarboxylic acid ester formed continuously drawing off at the lower end of the evaporator the salt formed.

4,520,210

PREPARATION OF CONCENTRATED AQUEOUS SOLUTIONS OF QUATERNIZATION PRODUCTS OF TERTIARY AMINOALKYL ESTERS OR TERTIARY AMINOALKYLAMIDES OF ACRYLIC OR METHACRYLIC ACID

Kurt Schneider, Bad Durkheim; Wilfried Heide, Erpolzheim; Juergen Hartmann, Ludwigshafen, and Heinrich Hartmann, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Nov. 30, 1983, Ser. No. 556,409

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244274

Int. Cl.³ C07C *93/193, 103/70*

U.S. Cl. 560—222 **6 Claims**

1. A process for the preparation of a concentrated aqueous solution of a quaternization product of a tertiary aminoalkyl ester or tertiary aminoalkylamide of acrylic or methacrylic acid by reaction of the corresponding ester or amide with an alkylating agent in a water-soluble ketone as solvent, wherein, in order to isolate the quaternization product, an amount of water is added to the reaction mixture such that two phases form, and the lower aqueous phase, which contains the quaternization product in solution, is separated from the upper phase, which contains the ketone and residual alkylating agent.

4,520,211

PROCESS FOR THE CONTINUOUS PREPARATION OF POLYHYDRIC ALCOHOLS

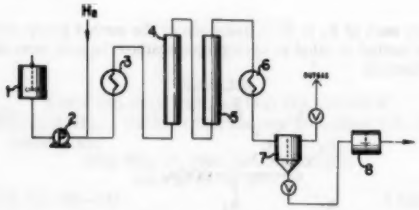
Herbert Lepper, Köln-Mühlheim, and Hartwig Schütt, Düsseldorf-Benrath, both of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Düsseldorf-Holthausen, Fed. Rep. of Germany

Continuation of Ser. No. 386,598, Jun. 9, 1982, abandoned. This application Feb. 24, 1984, Ser. No. 583,145

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1981, 3144320

Int. Cl.³ C07C *31/26, 29/14*

U.S. Cl. 568—863 **11 Claims**



1. In a continuous process for preparing polyhydric alcohols by the hydrogenation of carbohydrates in the presence of ruthenium-containing catalysts at elevated temperature and elevated pressure, the improvement wherein the carbohydrates are in aqueous solution or in a colloidal solution or suspension in water and wherein the catalyst comprises a catalyst solid bed of ruthenium carrier catalyst in lumps.

4,520,212

PROCESS FOR PRODUCING MYRCENOL

Shigeru Mitsuhashi; Hidenori Kumobayashi, and Susumu Akutagawa, all of Kanagawa, Japan, assignors to Takasago Perfumery Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1983, Ser. No. 563,810

Claims priority, application Japan, Dec. 27, 1982, 57-228479

Int. Cl.³ C07C *29/02, 33/02*

U.S. Cl. 568—875 **10 Claims**

1. A process for producing myrcenol which comprises:

(a) deaminating hydroxygeranyl dialkylamine or hydroxyneryl dialkylamine with a palladium-phosphine-cation complex catalyst of the formula:

$$(<\bullet: PdL)^{+}X^{-}$$

wherein

$<\bullet$ represents η-allyl,

L represents a tertiary phosphine, and

X represents a counter anion;

said deaminating being carried out at a temperature of about 100°–150° C. and under a reduced pressure of about 1–50 mmHg.

4,520,213

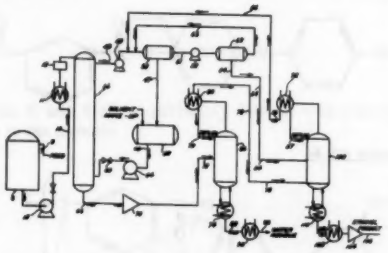
METHOD FOR SOLVENT RECOVERY IN SOLVENT SEPARATION OF ETHANOL FROM WATER

John G. Victor, Indian Head Park, Ill., assignor to Institute of Gas Technology, Chicago, Ill.

Continuation-in-part of Ser. No. 374,402, May 3, 1982,. This application Jul. 14, 1983, Ser. No. 513,922

Int. Cl.³ C07C *29/76, 31/08, 29/86, 7/144*

U.S. Cl. 568—913 **5 Claims**



1. A process for the extraction of ethanol from a liquid mixture of ethanol and water comprising the steps of:

(a) combining the liquid mixture with liquid solvent selected from a group consisting of propylene (propene), allene (propadiene), methyl acetylene (propyne), and methyl allene (1, 2 - butadiene) at a pressure of less than 400 psia and a temperature of from 20° to 80° C. to produce two layers, one layer being solvent and ethanol-rich, and the other being water-rich;

(b) separating the ethanol and solvent-rich layer from the water-rich layer, thereby forming liquid streams, one stream being ethanol and solvent-rich, and the other being water-rich;

(c) pressurizing the ethanol and solvent-rich stream;

(d) separating the solvent from the ethanol by reverse osmosis means;

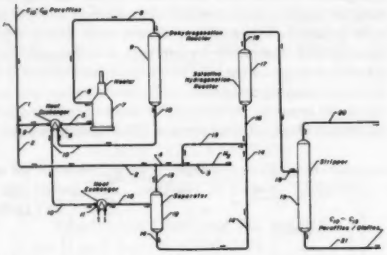
(e) maintaining said solvent at a pressure such that said solvent remains in a liquid state;

(f) recovering said solvent in a liquid state.

4,520,214
HIGH SELECTIVITY PROCESS FOR DEHYDROGENATION OF PARAFFINIC HYDROCARBONS

Bipin V. Vora, Elk Grove Village, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Apr. 4, 1984, Ser. No. 596,867
Int. Cl.[3] C07C *5/327, 5/00*
U.S. Cl. 585—254 12 Claims



1. In a process for the dehydrogenation of C_4-plus paraffinic hydrocarbons to monoolefinic hydrocarbons with a minimum presence of diolefinic hydrocarbons comprising the steps of:

(a) passing said C_4-plus paraffinic hydrocarbons and hydrogen as a feed stream through a dehydrogenation reaction zone maintained at dehydrogenation conditions to produce a vapor phase dehydrogenation reaction zone effluent stream comprising:
(i) hydrogen,
(ii) by-product light hydrocarbons having fewer than four carbon atoms per molecule,
(iii) undehydrogenated C_4-plus paraffinic hydrocarbons,
(iv) C_4-plus monoolefinic hydrocarbons, and
(v) C_4-plus diolefinic hydrocarbons;

(b) cooling said dehydrogenation reaction zone effluent stream to partially condense said dehydrogenation reaction zone effluent stream to a vapor-liquid phase stream;

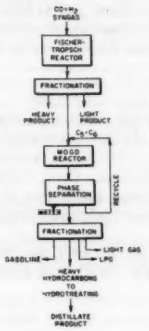
(c) separating said cooled vapor-liquid phase dehydrogenation reaction zone effluent in a vapor-liquid separation zone maintained at vapor-liquid separation conditions into a separation zone overhead vapor stream comprising hydrogen and a separation zone bottoms liquid stream comprising:
(i) dissolved hydrogen,
(ii) by-product light hydrocarbons having fewer than four carbon atoms,
(iii) C_4-plus paraffinic hydrocarbons,
(iv) C_4-plus monoolefinic hydrocarbons, and
(v) C_4-plus diolefinic hydrocarbons;
the improvement which comprises passing said separation zone bottoms liquid stream and a controlled amount of a hydrogen feed stream to a selective hydrogenation reaction zone located downstream of said vapor-liquid separation zone and upstream of a stripping zone as hereinafter defined in step (d), said hydrogenation zone containing a selective hydrogenation catalyst and maintained at selective diolefin hydrogenation conversion conditions, said amount of hydrogen selected to be effective to selectively convert said diolefinic hydrocarbons to monoolefinic hydrocarbons and to produce a hydrogenation reaction zone effluent stream substantially free of C_4-plus diolefinic hydrocarbons; and

(d) stripping said hydrogenation reaction zone effluent stream in a stripping zone maintained at stripping conditions effective to result in the production of a stripping zone overhead stream containing substantially all hydrogen and light hydrocarbons present in said hydrogenation zone effluent and a stripping zone bottoms stream substantially free of diolefins and containing C_4-plus monoolefinic hydrocarbons as the product stream of said process.

4,520,215
CATALYTIC CONVERSION OF OLEFINIC FISCHER-TROPSCH LIGHT OIL TO HEAVIER HYDROCARBONS

Hartley Owen, Belle Mead; Samuel A. Tabak, Wenonah, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1984, Ser. No. 600,642
Int. Cl.[3] C07C *2/74*
U.S. Cl. 585—255 9 Claims



1. A continuous process for converting a feedstock mixture comprising a major amount of C_5–C_6 olefins and a minor amount of oxygenated hydrocarbons to higher hydrocarbons comprising distillate product comprising:

combining olefinic feedstock with a pressurized liquid recycle stream comprising a major fraction of C_5^+ olefins;

contacting the diluted feedstock with a shape selective medium pore oligomerization catalyst under reaction conditions at elevated temperature in a pressurized reactor zone to convert olefins to heavier hydrocarbons;

reducing pressure on effluent from the reactor zone to flash volatile components into a vapor phase and recover a heavy liquid stream from a phase separator;

condensing a major portion of the vapor phase by cooling under pressure to provide substantially all of a liquid olefinic recycle stream for combining with the feedstock, and recovering condensed water by-product from oxygenate conversion to hydrocarbons; and

fractionating the heavy liquid stream from the flashed reactor effluent to recover a heavy distillate hydrocarbon product stream.

2. The process of claim 1 comprising the further step of hydrotreating the distillate hydrocarbon product stream to obtain a distillate product having a viscosity of at least 1.8 centistokes, cetane number greater than 50, and bromine number less than 2.

4,520,216
PROCESS FOR THE PREPARATION OF SYNTHETIC HYDROCARBONS

Allan Skov, Lyngby, and Jens R. Rostrup-Nielsen, Virum, both of Denmark, assignors to Haldor Topsoe, Lyngby, Denmark

Filed May 10, 1984, Ser. No. 609,045
Claims priority, application Denmark, May 11, 1983, 2105/83
Int. Cl.[3] C07C *1/20*
U.S. Cl. 585—315 3 Claims

1. In a process for the preparation of synthetic hydrocarbons by catalytic conversion of a synthesis gas containing hydrogen and carbon oxides, comprising (a) converting in a first step a

feed stream containing the synthesis gas in the presence of a catalyst, at a pressure of 10–80 bar and a temperature of 200°–300° C. into an intermediate product containing methanol and/or dimethyl ether, and (b) converting in a second step the entire intermediate product from the first step, in the presence of a catalyst and at substantially the same pressure as in the first step, to form a raw product steam of hydrocarbons, cooling said raw product stream and thereby separating it into a a condensed product stream and a gaseous recycle stream, recycling said recycle stream without further separation to the inlet of the first step,

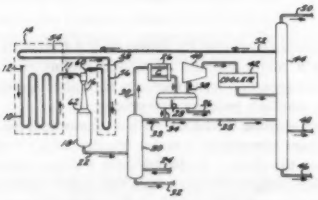
the improvement of carrying out the second conversion step at an inlet temperature of 300°–340° C., while supplying heat to obtain an outlet temperature of 410°–440° C., the difference between inlet temperature and outlet temperature being at the same time at least 30° C. higher than the temperature increase caused by the heat generated by the chemical reaction taking place in the second step.

4,520,217

PYROLYSIS OF NATURAL GAS LIQUIDS TO AROMATIC HYDROCARBONS USING A HOT RECYCLED GAS

Ronald G. Minet, Pasadena, Calif.; Mario Dente; Eliseo Ranzi, both of Milan, Italy, and Sunny H. K., Pasadena, Calif., assignors to Kinetics Technology International Corp., Monrovia, Calif.

Filed Dec. 10, 1981, Ser. No. 329,430
Int. Cl.³ C07C *2/54;* C10G *35/02*
U.S. Cl. 585—415 **4 Claims**



1. A process for the production of light aromatics from a feedstock comprising one or more of the natural gas liquid components which comprises:

(1) pyrolyzing said feedstock in a first pyrolysis zone from a temperature of about 620° C. to a temperature in excess of about 750° C. for a total residence time less than about one second;

(2) admixing the pyrolyzed feedstock with a pyrolyzed recycle stream comprising C_2–C_4 hydrocarbons such that the sensible heat of the admixture is sufficient to initiate the reaction of forming light aromatics;

(3) quenching the reacting admixture;

(4) separating said reacted admixture into a C_{8+} tar and an offgas;

(5) further separating the offgas into fractions comprising a light aromatic product and said recycle stream; and

(6) pyrolyzing said recycle stream in a second pyrolysis zone to form the pyrolyzed recycle stream of step (2).

4,520,218

PRODUCTION OF DIALKYLATED AROMATICS

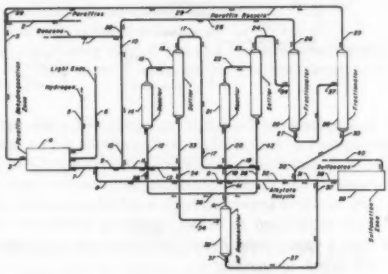
Roy C. Berg, Park Ridge; Thomas P. Malloy, Lake Zurich, and Bipin V. Vora, Elk Grove Village, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Feb. 23, 1984, Ser. No. 582,657
Int. Cl.³ C07C *2/64*
U.S. Cl. 585—449 **16 Claims**

1. A process for the production of dialkylated aromatic hydrocarbons which comprises the steps of:

(a) alkylating a feed aromatic hydrocarbon with a first portion of a feed acyclic olefinic hydrocarbon in a first alkylation stage of a multi-stage alkylation zone maintained at alkylation-promoting conditions to produce a first alkylation stage effluent stream which comprises the feed aromatic hydrocarbon and a monoalkylated aromatic hydrocarbon;

(b) admixing the first alkylation stage effluent stream, a hereinafter characterized recycle stream and a second portion of the feed acyclic olefinic hydrocarbon to form a composite stream, said composite stream having a mole ratio of unalkylated aromatic hydrocarbon to monoalkylated aromatic hydrocarbon of less than about 1:1, and passing said composite stream into a subsequent second alkylation stage of the alkylation zone maintained at alkylation-promoting conditions to further alkylate said monoalkylated aromatic hydrocarbons and to produce a second alkylation stage effluent stream which comprises the feed



aromatic hydrocarbon, the monoalkylated hydrocarbon, and a dialkylated hydrocarbon;

(c) fractionating said alkylation zone effluent stream which comprises the feed aromatic hydrocarbon, the monoalkylated hydrocarbon, and the dialkylated hydrocarbon in a fractionation zone, to produce a first process stream which comprises the monoalkylated aromatic hydrocarbon and the aromatic dialkylated hydrocarbon; and,

(d) withdrawing a first portion of the first process stream as a product stream containing said dialkylated aromatic hydrocarbon and passing a second portion of the first process stream into the second alkylation stage of said alkylation zone as the previously referred to recycle stream to form said composite stream having a mole ratio of unalkylated feed aromatic hydrocarbon to monoalkylated aromatic hydrocarbon of less than about 1:1 to increase the production of dialkylated aromatic hydrocarbons.

4,520,219

PROCESS FOR THE PRODUCTION OF PSEUDOCUMENE OR DURENE

Haruhito Sato, Sodegaura, Japan, assignor to Idemitsu Kosan Company Limited, Tokyo, Japan

Filed Sep. 14, 1983, Ser. No. 532,261
Claims priority, application Japan, Sep. 24, 1982, 57-164999
Int. Cl.³ C07C *2/70*
U.S. Cl. 585—462 **16 Claims**

1. A process for producing at least one of pseudocumene and durene comprising reacting xylene and a methylating agent in the presence of a catalyst, which is at least one crystalline silicate selected from the group consisting of crystalline borosilicate, fluorine-containing crystalline borosilicate, fluorine-containing crystalline aluminosilicate, and fluorine-containing crystalline boroaluminosilicate;

said fluorine-containing crystalline borosilicate being prepared by contacting crystalline borosilicate with at least one fluorine-containing compound selected from the group consisting of HF, NH_4F, NaF, BF_3, $CFCl_3$,

CF_2Cl_2, CF_3Cl, $CHFCl_2$, CHF_2Cl, CHF_3, $CF_2ClCFCl_2$ and CF_2ClCF_2Cl,

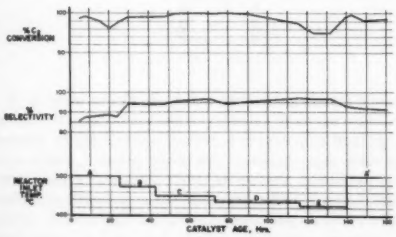
said fluorine-containing crystalline aluminosilicate being prepared by contacting crystalline aluminosilicate with at least one fluorine-containing compound selected from the group consisting of HF, NH_4F, NaF, BF_3, $CFCl_3$, CF_2Cl_2, CF_3Cl, $CHFCl_2$, CHF_2Cl, CHF_3, $CF_2ClCFCl_2$ and CF_2ClCF_2Cl, and

said fluorine-containing crystalline boroaluminosilicate being prepared by contacting crystalline boroaluminosilicate with at least one fluorine-containing compound selected from the group consisting of HF, NH_4F, NaF, BF_3, $CFCl_3$, CF_2Cl_2, CF_3Cl, $CHFCl_2$, CHF_2Cl, CHF_3, $CF_2ClCFCl_2$ and CF_2ClCF_2Cl.

4,520,220
ALKYLATION OF AROMATICS EMPLOYING SILICALITE CATALYSTS

James M. Watson; James R. Butler, and Cleve H. Forward, all of Big Spring, Tex., assignors to Cosden Technology, Inc., Dallas, Tex.

Filed Feb. 22, 1982, Ser. No. 350,673
Int. Cl.³ C07C *2/68*
U.S. Cl. 585—467 **11 Claims**



1. A process for alkylating aromatic substrates with alkylating agents comprising passing these reactants in the absence of steam cofeed through a reaction zone containing a crystalline silica polymorph silicalite catalyst under conversion conditions including reaction zone inlet temperatures of from about 350° C. to about 500° C.

4,520,221
PROCESS OF MAKING HIGH VI LUBES

Catherine S. Hsia Chen, Berkeley Heights, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 9, 1984, Ser. No. 598,139
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—517 **12 Claims**

1. In a process for the production of high VI lubricating oils in high yields from lower olefins comprising contacting said olefins over a ZSM-5 type catalyst at elevated temperatures and pressures and obtaining a liquid product from which said lubricating oils are separated, wherein said catalyst is treated with a bulky alkylpyridine whereby its surface activity or acidity is removed or substantially eliminated.

4,520,222
POLYMERIZATION CATALYST AND DEODORIZING AGENT AND PROCESS OF USE

Robert E. Reusser; Joseph R. Kenton, and Elizabeth A. Todd, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 448,558, Dec. 10, 1982, Pat. No. 4,425,226. This application Aug. 1, 1983, Ser. No. 518,857
Int. Cl.³ C07C *2/02*
U.S. Cl. 585—526 **6 Claims**

1. A polymerization process comprising bringing an olefin-containing feed into contact with a catalyst under conditions sufficient to effect polymerization of at least a portion of the olefin content of the feed; wherein said catalyst comprises calcium silicate treated with at least one acid; wherein the treated calcium silicate is heated to a temperature of at least about 100° C. and contacted with nitrogen gas; and wherein said at least one acid is selected from sulfuric acid, phosphoric acid and nitric acid.

4,520,223
DEHYDROGENATION PROCESS

Roger N. McGinnis, Lewis E. Drehman, and Emory W. Pitzer, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 379,804, May 19, 1982, Pat. No. 4,431,750. This application Oct. 11, 1983, Ser. No. 540,598
Int. Cl.³ C07C *5/333, 5/32, 5/02*; C10G *35/04*
U.S. Cl. 585—629 **28 Claims**

1. A process for dehydrogenation of alkanes which comprises contacting at least one alkane under dehydrogenation conditions with a supported platinum-group metal catalyst wherein said platinum-group metal is deposited substantially toward the surface of said support and prepared by the process which comprises:

(a) impregnating a porous support with an aqueous solution of a platinum-group metal sulfite and a rhenium compound wherein said platinum-group metal is at least one of platinum, iridium, osmium, palladium, rhodium, and ruthenium,

(b) drying the thus-prepared composite, and

(c) heating the thus-dried composite at a temperature sufficient to decompose said sulfite,

thereby producing said supported platinum-group metal catalyst.

4,520,224
THERMAL CRACKING METHOD FOR PRODUCING OLEFINS FROM HYDROCARBONS

Yoshihiko Kamimura; Toshiro Okamoto, both of Tokyo; Naoyuki Takahashi, Hiroshima; Hiroshi Makihara, Hiroshima, and Michio Oshima, Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Mar. 9, 1983, Ser. No. 473,761
Claims priority, application Japan, Mar. 11, 1982, 57-38684
Int. Cl.³ C07C *4/02*
U.S. Cl. 585—648 **4 Claims**

1. A thermal cracking method for producing olefins from hydrocarbons which comprises the steps of forming a mixed gas of methane and hydrogen in a methane/hydrogen mol ratio of 0.1 to 4 together with the hydrocarbons prior to the thermal cracking reaction; and reacting the mixture under conditions that the total concentration of said methane and hydrogen is at least 40 mol% at the outlet of a reactor, the partial pressure of said hydrogen is at least 3 bars, the temperature at the outlet of said reactor is from 800° to 1200° C., and the residence time in said reactor is from 5 to 300 milliseconds; and quenching the reaction product discharged through the outlet of said reactor.

4,520,225
PROCESS FOR THE PRETREATMENT OF LIGHT OLEFIN FRACTIONS

Claude Marty, and Philippe Engelhard, both of Le Havre, France, assignors to Compagnie Francaise de Raffinage, Paris, France

Filed Nov. 14, 1983, Ser. No. 551,187
Claims priority, application France, Nov. 12, 1982, 82 19009
Int. Cl.³ C07C *3/18, 7/00*
U.S. Cl. 585—832 **20 Claims**

1. A process for the pretreatment of a light olefin fraction to selectively remove isobutene and butadiene, comprising:

contacting the olefin fraction with boron trifluoride in a gas

phase at a temperature of from 0° to 100° C. and a pressure of from 0 to 50 bars to form polymers of isobutene and butadiene in an effluent; and

separating the boron trifluoride and the polymers of isobutene and butadiene from the effluent.

4,520,226

TREATMENT OF GRAFT VERSUS HOST DISEASE USING A MIXTURE OF T-LYMPHOCYTE SPECIFIC MONOCLONAL ANTIBODY: RICIN CONJUGATES

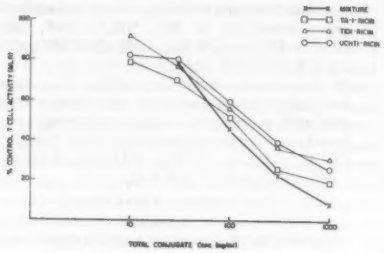
David M. Neville, Jr., Bethesda, Md., and Richard J. Youle, Washington, D.C., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 399,257, Jul. 19, 1982,. This application Jan. 7, 1983, Ser. No. 456,401

Int. Cl.[3] **A61K** *39/395;* **C12N** *15/00*

U.S. Cl. 424—85 **5 Claims**

5. A method for eliminating T-cells from human bone marrow grafts consisting essentially of separately convalently bonding monoclonal antibodies TA-1, T101, and UCHT1 to ricin toxins to form three human T-cell specific cytotoxic hybrids, forming a mixture by combining equal amounts of each hybrid, and incubating under standard biological conditions said mixture with human bone marrow cells in the presence of a suitable amount of lactose.



4,520,227

STRAIN RELIEF CONNECTION BETWEEN A HOUSING AND AN ELECTRIC CONDUCTOR ASSEMBLY

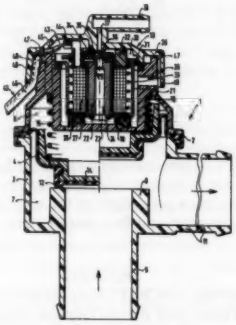
Erwin Krimmer, Plüderhausen, and Siegfried Fehrenbach, Markgröningen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 411,052

Claims priority, application Fed. Rep. of Germany, Mar. 6, 1982, 3208108

Int. Cl.³ H02G *3/18, 15/007;* F16K *31/06*

U.S. Cl. 174—65 R 1 Claim



1. A strain relief connection formed between a housing and an electric conductor assembly passing from the exterior of the housing to the interior thereof, comprising: a housing having two plastic housing parts, said housing parts meeting each other over a contact surface; an electric conductor assembly including stranded conductors extending through individual plastic jackets and a common insulating sheath surrounding said plastic jackets; said electric conductor assembly passing from the exterior of said housing to the interior thereof and having portions of said plastic jackets arranged over and contacting said contact surface between said housing parts; said housing parts being heat sealed together with said plastic jackets at said contact surface; and one of said housing parts having a collar-shaped attachment inclined with respect to said contact surface in the vicinity of said electric conductor assembly and partially overlapping said sheath and pressing said sheath against the other housing part.

4,520,228

MULTI-LAYER CONDUCTOR PLATE AND A METHOD OF MAKING

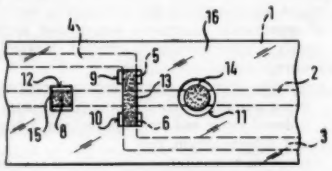
Horst Hoffmann, Glonn, Fed. Rep. of Germany, assignor to Wilhelm Ruf KG, Munich, Fed. Rep. of Germany

Filed Aug. 24, 1982, Ser. No. 410,983

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137279

Int. Cl.³ H05K *1/09*

U.S. Cl. 174—68.5 3 Claims



1. A multi-layer conductor plate, comprising:

a base plate means made of electrical insulation material, said base plate means being of substantial facial extent;

a first layer of copper provided on a face of said base plate means in the form of at least one conductor path which is continuous along at least a portion of said face, said one conductor path having laterally opposite edges, and in the form of at least another conductor path which would crossingly intersect said one conductor path if said other conductor path were to be continuous, but said other conductor path being discontinuous adjacent said lateral edges of said one conductor path so as to provide two respective piers;

a layer of etch-resistant, electrically conductive varnish superimposed upon at least some of said first layer of copper in said conductor paths;

a layer of electrical insulation material superimposed upon said face at least in said portion so as to cover all of said etch-resistant electrically conductive varnished copper layer conductor paths except for being apertured by aperture means at a plurality of conductor attachment sites, including ones coinciding with both of said piers;

a layer of galvanizable electrically conductive varnish, this layer being selectively applied upon said layer of electrical insulation material and upon selected ones of said sites so as to define a second layer of electrical conductor paths, this second layer including an electrical conductor path which electrically connects between said piers of said second conductor path while crossing-over but being electrically insulated from said first conductor path by said layer of electrical insulation material; and

a galvanically-applied metal layer provided upon said galvanizable electrically conductive varnish, thereby bridging said piers.

4,520,229

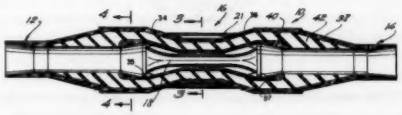
SPLICE CONNECTOR HOUSING AND ASSEMBLY OF CABLES EMPLOYING SAME

Glenn J. Luzzi, Mt. Bethel, Pa., and Andrew A. Kominiak, Flanders, N.J., assignors to Amerace Corporation, New York, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,325

Int. Cl.³ H02G *15/184*

U.S. Cl. 174—73 R 17 Claims



1. A housing for use in completing a splice connection between first and second electrical power cables, the cables each having an outside diameter and including an inner conductor and a cable jacket surrounding the inner conductor, the cable jacket including insulation around the conductor and a shield around the insulation, the splice connection including a connector element joining together bared portions of the inner conductors of the cables, the connector element having a diameter smaller than the outside diameter of each cable, the housing comprising:

a tubular elastomeric sleeve having opposite ends;

first and second coaxial end portions adjacent the corresponding ends of the sleeve, each end portion including an end portion bore extending axially through the respective end portion and having an inside diameter generally complementary to the outside diameter of a corresponding cable over which the end portion is to be placed;

a central portion located between the first and second end portions and coaxial therewith, the central portion including an axially-extending wall of essentially uniform wall thickness, said wall having an inside surface with circumferentially alternating inner and outer surface areas merg-

ing circumferentially smoothly with one another along said inside surface, each inner surface area extending radially inwardly to an inner position located radially inwardly of the inside diameter of each end portion bore, and each outer surface area extending radially outwardly to an outer position located radially outwardly of the inside diameter of each end portion bore; and

transition portions located between each end portion and the central portion for enabling resilient radial flexing of the wall of the central portion to move each inner surface area resiliently outwardly and inwardly relative to the end portions, between said inner and outer positions, in response to movement of the sleeve in axial directions along a cable such that each inner surface area is movable resiliently radially between engagement with the corresponding cable jacket and engagement with the connector element.

4,520,230

CROSS-LINKED POLYETHYLENE INSULATED POWER CABLE WITH IMPROVED ELECTRIC BREAKDOWN STRENGTH AND METHOD FOR MANUFACTURING THE SAME

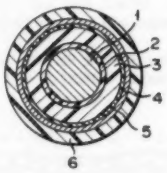
Kenji Uesugi, Yotsukaido; Shin-ichi Irie, Ichihara; Yoshihisa Asada, Chiba; Masahiro Maeda, Yokohama; Nobuyuki Yamada, Chiba, and Hideaki Nakagawa, Suzuka, all of Japan, assignors to The Furukawa Electric Co., Ltd. and Mitsubishi Petrochemical Company Limited, both of Tokyo, Japan

Continuation of Ser. No. 262,908, May 12, 1981, abandoned. This application Aug. 15, 1983, Ser. No. 523,895

Claims priority, application Japan, May 21, 1980, 55-66371; May 23, 1980, 55-68643; May 26, 1980, 55-69008

Int. Cl.³ B32B *15/00, 27/00;* **H01B** *7/00*

U.S. Cl. 174—107 **7 Claims**



1. A cross-linked polyethylene insulated power cable with improved electric breakdown strength, comprising an elongated conductor and an insulating layer of cross-linked polyethylene surrounding said conductor, said cross-linked polyethylene having a density of 0.918 g/cm^3 or more, a crystal thickness of 76 Å or more and a gel fraction of 60% or more, the ratio of the impulse breakdown strength of said cross-linked polyethylene at 90° C. to the impulse breakdown strength at room temperature being at least 80%.

4,520,231

SAFETY CAP FOR FENCE POSTS

Leslie A. Hubbell, 40260 County Rd. 13, Elizabeth, Colo. 80107

Filed Dec. 15, 1983, Ser. No. 561,907

Int. Cl.³ H01B *17/14;* **A01K** *3/00*

U.S. Cl. 174—158 F **14 Claims**

1. A cap useable with a T-shaped fence post comprising:

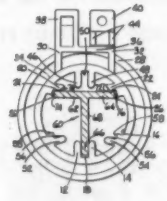
an elongated generally hollow body having an opening at one end thereof;

a cover over the other end of said body;

means for providing the inner surface of said body with at least two longitudinally extending surfaces for resiliently contacting each arm of said T-shaped fence post adjacent the open end of each arm;

a first pair of spaced apart ribs extending radially inward from the inner surface of said body;

said first pair of ribs extending in a longitudinal direction and forming a generally U-shaped recess adapted to receive therebetween the stem of a T-shaped fence post; and



said first pair of ribs extending inwardly for only a relatively short distance so that only that portion of the stem of said T-shaped fence post adjacent the open end of said stem is located between said first pair of ribs.

4,520,232

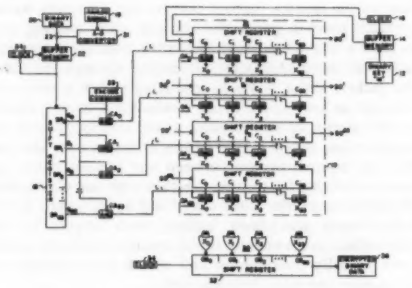
POLYGRAPHIC ENCRYPTION-DECRYPTION SYSTEM

William J. Wilson, 1239 Blevins Gap Rd., Huntsville, Ala. 35802

Filed Apr. 30, 1982, Ser. No. 373,341

Int. Cl.³ H04L *9/04*

U.S. Cl. 178—22.05 **2 Claims**



2. A communications system comprising:

first and second communications stations;

communications signal transmission means for the transmission of first signals from said first station to said second station and for transmission of said second signals from said second station to said first station;

said first and second stations each comprising:

buffer storage means having a selected plurality of ordered binary storage locations, and responsive to a series of binary state input signals, including signals derived from said communications signal transmission means, for selectively and temporarily storing, in order of appearance, successive sets of said series of input signals in correspondingly ordered storage locations,

key storage means comprising:

a plurality of binary signal memory locations, and there being stored therein an invertible binary matrix of ordered rows and columns having a common row and column origin, and

readout means including a plurality of row oriented sets of electronic gating means, one set for each row of memory locations, each electronic gating means of a set being coupled to a separate memory location of the same row, and being responsive to a selected state of binary signal control input, for gating to an output

the binary state of the memory location to which the gate is coupled,

coupling means for supplying the signal state of each discretely ordered storage location of said buffer storage means, as a control input, to a row oriented discrete set of electronic gating means for a said row of said matrix, whereby, where said selected signal state is present in one of said ordered storage locations of said buffer storage means, the signal states of a coordinately ordered row of said matrix appears across outputs of a said set of electronic gating means, and, where a non-selected state exists, each gating means of a coordinate set of electronic gating means for a row of said matrix provides a like state output, and do not, together, gate out the signal states of a row of memory locations as outputs;

a set of row oriented exclusively OR logic circuit means, each said logic circuit means being responsive to a column oriented set of outputs of said electronic gating means for providing, in a selected order, an ordered set of modulo 2 character output signals, and

signal means responsive to successively following said ordered set of modulo 2 character output signals for providing said last-named output signals as a series of sets of binary output signals to said communication means; and

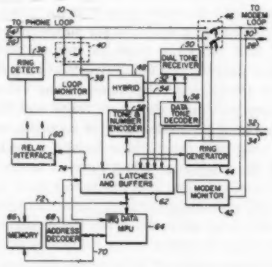
said invertible matrix of said key storage means of said first station is the inverse of said invertible matrix of said key storage means of said second station.

4,520,233

TELEPHONE LINE SECURITY APPARATUS

James W. Smith, San Jose, Calif., assignor to Omnicom Engineering, San Jose, Calif.

Filed Apr. 16, 1982, Ser. No. 369,289
Int. Cl.³ H04L *9/00;* H04K *1/00*
U.S. Cl. 179—1.5 R **7 Claims**



1. A telephone call-in security apparatus for controlling connections between a single telephone line and a telephone modulator-demodulator (modem) apparatus at a location remote from a telephone switching station and connected to a publically accessible switched telephone network, said security apparatus comprising:

means coupled to said telephone line for detecting ring signals;

means responsive to said ring signal detecting means for connecting said apparatus to said telephone line in a two-way telephone connection;

means coupled to said telephone line through said connection means for detecting tone encoded signals of an incoming telephone call;

means operative to check said detected tone encoded signal for an authorized access code for initiating a call-back sequence to a telephone terminal corresponding to said access code, said call-back sequence initiating means including means for detecting for a forward disconnect condition from the switched telephone network; and

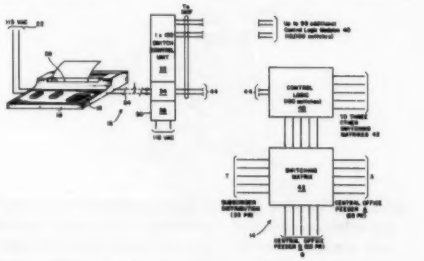
means responsive to a two-way telephone line connection sequence subsequent to said call-back sequence for coupling said telephone line to said modem.

4,520,234

REMOTE CABLE SWITCHING SYSTEM

Gary C. Fields, Oakland, Calif., and Gary E. Long, Loveland, Colo., assignors to Remote Switch Systems, Inc., Loveland, Colo.

Filed Apr. 11, 1983, Ser. No. 483,501
Int. Cl.³ H04M *11/00, 3/00;* H04Q *1/28*
U.S. Cl. 179—2 A **12 Claims**



1. A remote cable switching system for selectively switching communications pairs of an incoming trunk to one or the other pairs of two available outgoing trunks, said system comprising:

a remote switch module having input terminals accommodating N input pairs and having output terminals accommodating 2N output pairs, and having N latching switches having terminals connecting said N input pairs and said 2N output pairs in accordance with a connection pattern established by switching commands generated and sent from a central location,

a normally quiescent remote control module at the location of said remote switch module and operatively connected thereto, said control module for receiving and accumulating electrical power and for receiving and decoding electrical switching commands from a central control location during a command sequence, for generating latch operating signals in response to said commands, and for applying said operating signals to operate the said latching switches to which they pertain,

a central controller at a central location remote from said remote switch and control modules, said controller including data input means for receiving switching information and means for converting said switching information into responsive electrical switching commands, said central controller being connected by a control circuit to said remote control module and providing constant current power thereto and electrical switching commands thereto during each command sequence.

4,520,235

ELECTRONIC KEY TELEPHONE SYSTEM

Kenichi Morikawa; Kazuyuki Nagatomi, and Mitsuo Katanuma, all of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

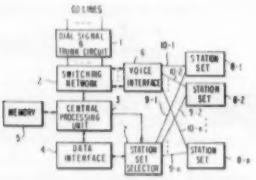
Filed May 10, 1983, Ser. No. 493,199
Claims priority, application Japan, May 10, 1982, 57-77902
Int. Cl.³ H04M *1/00, 1/72*
U.S. Cl. 179—99 LS **7 Claims**

1. A key telephone system for selectively connecting a plurality of telephone stations to a plurality of telephone lines, said key telephone system comprising:

central switching means;

central control means; and

a plurality of key telephone stations each being connected to the central switching means by a single communication path and also being connected to the central control means by a single data path, each of the key telephone stations including first to lth means for displaying service status, source means for generating various signals indicative of modes of service, a plurality of buttons for specifying service request, and means responsive to receipt of service status information sent from the central control means for transmitting over the data path to the central control means service request information of the buttons corresponding to the display means identified by the service status information; wherein



said central control means including means for scanning the key telephone stations in the first to lth display means, in such a manner that the telephone stations are successively accessed in each ith ($1 \leqq$(integer)$\leqq l-1$) display means of the key telephone stations, and then in each $(i+1)$th display means, to transmit over each of the data paths each service status information and to receive each service request information, each service status information being generated in response to receipt of each service request information sent from the key telephone stations;

each service status information is made up of data identifying one of the first to lth display means and specifying the modes of service; and

each of the telephone stations includes means responsive to the service status information for selecting any of the various signals to be supplied to identified display means.

4,520,236

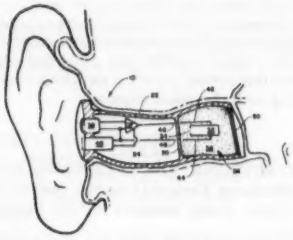
SOUND TRANSFER FROM A HEARING AID TO THE HUMAN EAR DRUM

Edouard A. Gauthier, El Cajon, Calif., assignor to Nu-Bar Electronics, San Diego, Calif.

Filed Nov. 30, 1983, Ser. No. 556,604

Int. Cl.³ H04M *1/04*

U.S. Cl. 179—107 E **16 Claims**



9. An improved receiver for a miniaturized hearing aid comprising:

a partially enclosed chamber open to the ear drum along one surface thereof;

a receiver having a good emitting aperture positioned within said chamber with said sound emitting aperture directed to the wall of said chamber opposite said surface adjacent said ear drum; and

isolation means surrounding the entire receiver.

4,520,237

ELECTRODYNAMIC SPEAKER

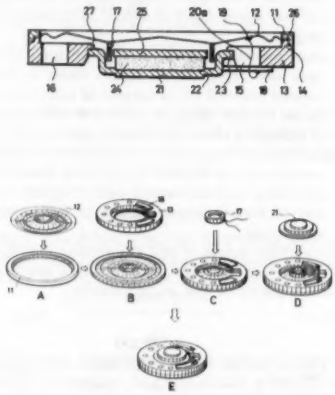
Fumikazu Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Sep. 23, 1982, Ser. No. 421,799

Claims priority, application Japan, Sep. 25, 1981, 56-151765

Int. Cl.³ H04R *9/04*

U.S. Cl. 179—115.5 ES **13 Claims**



1. An electrodynamic speaker comprising: a vibrating plate; a voice coil having a terminal and being secured to said vibrating plate; a magnetic circuit portion comprising a yoke, a pole piece and a magnet and being arranged so as to define a magnetic gap between the pole piece and the yoke; a main frame having a ring-shaped projection for supporting the peripheral portion of said vibrating plate; a ring-shaped guard frame having a step portion and being disposed atop the main frame to sandwich the peripheral portion of the vibrating plate between the step portion of the guard frame and the projection of the main frame; a lead substrate for securing said terminal of said voice coil; said main frame having a center hole which mates with the magnetic circuit portion and a notch portion adjacent to and opening into the center hole; the terminal of said voice coil extending through the notch portion and being secured to the lead substrate at the lower surface of the main frame; and means disposed at the periphery of the center hole of the main frame coacting with means disposed at the peripheral portion of the magnetic circuit portion for mounting the magnetic circuit portion on the lower surface of the main frame to thereby fixedly secure the magnetic circuit portion to the main frame.

4,520,238

PICKUP DEVICE FOR PICKING UP VIBRATION TRANSMITTED THROUGH BONES

Yasuo Ikeda, Oiso, Japan, assignor to Pilot Man-Nen-Hitsu Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 16, 1983, Ser. No. 552,246

Claims priority, application Japan, Nov. 16, 1982, 57-172389[U]; Nov. 19, 1982, 57-174340[U]

Int. Cl.³ H04R *1/46*

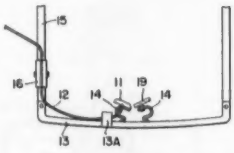
U.S. Cl. 179—121 C **18 Claims**

1. A pickup device for picking up vibration transmitted through bones comprising:

an eyeglass-like assembly having a face-opposing member which is placed in front of a human face, a pair of support-

ing members one end of each of which is connected to each end of said face-opposing member and at least one nosepiece which is made into intimate contact with at least one upper side portion of the nose;

a microphone which is mounted on said face-opposing member at a suitable position for directly picking up the audio



signal transmitted through bones as the solid vibration through said at least one nosepiece from said at least one upper side portion of the nose and for converting the picked up audio signal into an electrical signal; and

a flexible cord one end of which is connected electrically to said microphone and whose one portion is supported by said eyeglass-like assembly at least at one portion thereof.

4,520,239

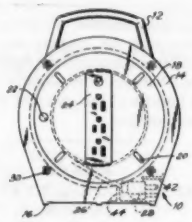
ELECTRICAL CORD REEL AND STORAGE SYSTEM

Frederic W. Schwartz, Providence, R.I., assignor to Cable Electric Products, Inc., Providence, R.I.

Filed Sep. 30, 1982, Ser. No. 430,893

Int. Cl.³ H02G *11/02;* **B65H** *75/40*

U.S. Cl. 191—12.4 **10 Claims**



1. A storage device for an electric cord, comprising:

two mating sections defining a housing, said housing having means defining a central opening;

an electric cord having a plug;

a reel for supporting and storing said electric cord, said reel being rotatable within said housing, said electric cord being wound upon said reel when said reel is caused to rotate;

a receptacle affixed to said reel having a plurality of electric plug element openings;

means for indicating the presence of an electric potential at said receptacle, when said plug is inserted into an electrical source;

a pair of reel flanges disposed upon said reel for supporting said electric cord; and

a plurality of spacer posts having the dual purpose of providing a given spacing between each section of said housing, and being in contact support of said reel flanges to provide extra support for winding said electric cord upon said reel.

4,520,240

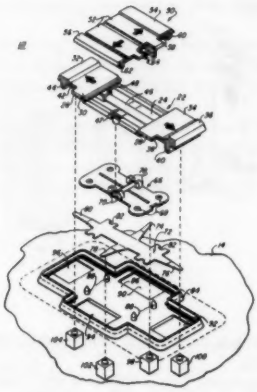
FOUR-WAY KEY SWITCH CONTROL MECHANISM

Dan E. Swindler, Round Rock, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 1, 1983, Ser. No. 556,872

Int. Cl.³ G09F *9/30;* **H01H** *3/00, 19/00*

U.S. Cl. 200—5 R **6 Claims**



1. A four-way switch comprising:

a switch key having:

a first switch topper having an upper and lower surface and an opening centrally located therein, said first switch topper also having a first and second pivot element positioned underneath said lower surface, said first and second pivot elements mounted at 90° to one another;

a second switch topper having an upper and lower surface adapted to be positioned in the opening of said first switch topper so that the upper surfaces of said first and and second switch toppers are substantially flush with one another, said second switch topper having a pivot assembly on its lower surface adapted to engage said first pivot element in said first switch topper to thereby pivotably secure said second switch topper to said first switch topper to allow movement of said second switch topper along a first axis only, and

base means having a pivot assembly thereon adapted to engage said second pivot element on said first switch topper to thereby pivotably secure said first switch topper to said base to allow movement of said first switch topper along a second axis which is 90° from said first axis;

protuberances located on the bottom surfaces of said first and second switch toppers at the terminal ends thereof; and

spring means engaging each of the protuberances of said first and second switch toppers;

a housing for accommodating said switch key, said housing having four apertures located therein around the periphery of said housing, said housing also comprising alignment means for positioning said switch key within said housing so that each of said protuberances is located directly above one of said apertures; and

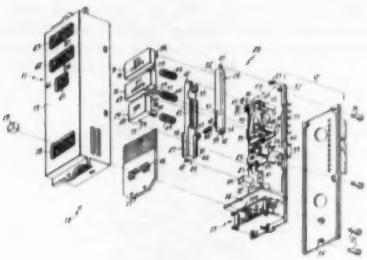
electrical switch means located below each of said apertures so that when an operator selectively pushes on the upper surface of either of the first and second switch toppers at the location of one of the protuberances, the electrical switch means located beneath the selected protuberance is activated.

4,520,241

MULTIPLE PUSH BUTTON SWITCH WITH LATCH MEMBERS

Floyd J. Sandi, Clawson, and Anthony Vultaggio, Warren, both of Mich., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Feb. 23, 1984, Ser. No. 583,061
Int. Cl.³ H01H 9/20
U.S. Cl. 200—5 B **6 Claims**



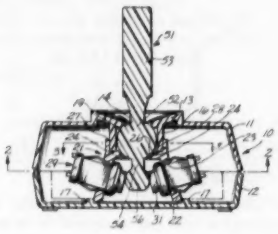
1. A multiple push-button switch comprising:
a housing;
first and second fixed contacts in said housing;
first and second leaf spring strips extending generally parallel to each other in side-by-side relation and mounted cantilever fashion in said housing with the free ends of said strips extending in opposite directions from respective fixed ends thereof; said first and second strips each being urged to a rest position by its natural resilience but adapted for flexing movement to an actuated position;
a movable contact carried by each of said strips intermediate its ends for engaging a respective one of said fixed contacts in one of said rest and actuated positions;
first latching means adapted to releasibly retain said first strip in its actuated position;
second latching means adapted to releasibly retain said second strip in its actuated position;
spring means for biasing each of said latching means to a normal latching position from which position said latching means is movable to an unlatching position for release of the respective one of said strips;
a first push-button actuator yieldably biased to an extended position in said housing, said first actuator being movable toward said first and second strips and being effective when depressed to deflect said strips from their rest positions to actuated positions in latched engagement respectively with said first and second latching means;
a second push-button actuator yieldably biased to an extended position in said housing, said second actuator being movable toward said first strip and said second latching means and being effective when depressed to deflect said first strip from its rest position to an actuated position in latched engagement with said first latching means and to concurrently move said second latching means from the normal latching position thereof to disengage said second latching means from said second strip when the latter is in its actuated position and thereby permit said second strip to return to its rest position; and
a third push-button actuator yieldably biased to an extended position in said housing, said third actuator being movable toward said first and second latching means from the normal latching positions thereof to disengage said first and second latching means respectively from said first and second strips when in the actuated positions thereof and thereby permit said strips to return to their rest positions.

4,520,242

JOYSTICK

Joseph D. Kopsho, Jr., San Marcos, Calif., assignor to Kraft Systems, Inc., Vista, Calif.

Filed Mar. 10, 1983, Ser. No. 473,781
Int. Cl.³ H01H 19/00
U.S. Cl. 200—6 A **10 Claims**



1. A joystick comprising:
a switch holder having four side walls and an opening at its top, each side wall having a switch opening;
four panel-mounted switches for activating an electrical circuit associated with that switch, each switch being mounted in the switch opening of a side wall of the switch holder, and each switch comprising:
an activator button depressible from an extended position wherein the electrical circuit associated with the switch is not activated to a fully depressed position wherein the electrical circuit is activated, said activator button extending into the interior of the switch holder;
spring means for urging the activator button toward the extended position;
an actuator arm comprising:
a ball rotatably mounted at a position above the opening in the top of the switch holder;
a handle extending upwardly from the ball and movable from a generally vertical neutral position; and
a switch engaging member extending downwardly from the ball through the opening into the interior of the switch holder and wherein the switch engaging member is centered between and slightly depresses all of the activator buttons of the switches when the handle is in the neutral position.

4,520,243

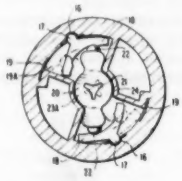
ELECTRICAL PLUG AND SOCKET CONNECTION DEVICE

Raymond E. McIntyre, 31 Southern Cross Dr., Cronin Island, Surfers Paradise, Queensland, Australia

Filed Sep. 10, 1982, Ser. No. 416,762
Claims priority, application Australia, Sep. 24, 1981, PF0906
Int. Cl.³ H01R 19/68
U.S. Cl. 200—51.07 **6 Claims**

1. An electrical plug and socket connection device comprising a male component having a plurality of connection pins and a centrally located guide pin extending outwardly therefrom with the guide pin having a longer length than each connection pin and a female component having a plurality of connection pin recesses, a central aperture, an internal cavity, a plurality of contact members with each contact member located adjacent to and extending into an associated connection pin recess with a portion extending into said cavity and a plurality of connection terminals extending into said cavity, a switching means rotatably mounted in said cavity and having a socket in alignment with said central aperture which is engageable by said guide pin when said connection pins of said male component are engaged in said recesses of said female component whereby upon rotation of one component relative to the other each connection pin abuts an adjacent contact member

and said switching means is pivoted by the engagement of said guide pin in said socket to simultaneously contact and thereby



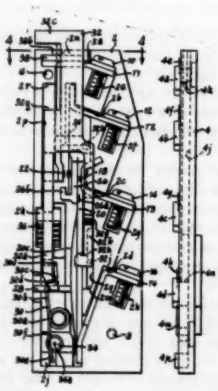
effect electrical connection between each contact member and a respective connection terminal.

4,520,244

CONSTANT LOAD SNAP SWITCH WITH MANUAL OR AUTOMATIC RESET, STOP AND TEST SELECTION

Kenneth A. Forsell, Whitefish Bay, and Edward A. Mallonen, New Berlin, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 27, 1982, Ser. No. 453,208
Int. Cl.³ H01H *5/22*
U.S. Cl. 200—67 DA **15 Claims**



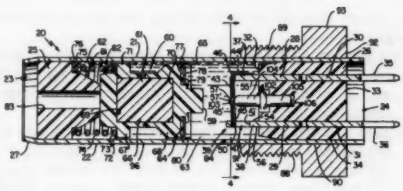
1. A constant load snap-action switch comprising:
an insulating housing;
normally-closed contacts in said housing comprising a stationary contact and a movable contact operable to open and closed states with respect to said stationary contact;
external terminals;
means connecting said stationary contact to one of said external terminals;
a snap-action flipper blade in said housing connecting said movable contact to another one of said external terminals and being operable in response to a force applied thereto for causing snap-action tripping of said movable contact at the trip point of said flipper blade from said normally-closed state to said open state;
trip means mounted to said housing and operable through a trip stroke to transmit a trip force to said flipper blade comprising:
means for maintaining the required trip force applied through said trip means substantially constant through a significant portion of said trip stroke to said trip point comprising:
a bias spring mounted in said housing for applying a bias force to said flipper blade which decreases with the trip stroke such that the required trip force remains substantially constant through a significant portion of said trip stroke.

4,520,245

DIFFERENTIAL PRESSURE OPERATED ELECTRICAL SWITCH CONSTRUCTION

Rolf H. Ochsner, Trumbull, Conn., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Sep. 27, 1983, Ser. No. 536,305
Int. Cl.³ H01H *35/38*
U.S. Cl. 200—82 R **13 Claims**



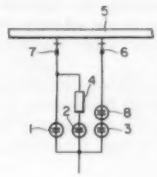
1. In a differential pressure operated electrical switch construction having a housing means carrying a pair of rigid substantially straight parallel terminals and an electrical switch means for electrically interconnecting said terminals together when said switch means is in one operating condition thereof and for electrically disconnecting said terminals from each other when said switch means is in another operating condition thereof, said housing means having actuator means responsive to differential pressures acting across the same and being operatively associated with said switch means to place said switch means in said one condition thereof when having a certain differential pressure acting across the same and to place said switch means in said other condition thereof when having another certain differential pressure acting across the same, the improvement wherein one of said terminals has an end provided with a substantially rectangular opening passing transversely and completely therethrough and defining a substantially straight interior edge means of said one terminal, said switch means comprising a movable switch blade having one end carried by the other of said terminals and having another end disposed in said opening for engaging against said edge means and thereby place said switch means in said one condition thereof and for being out of engagement with said edge means and thereby place said switch means in said other condition thereof.

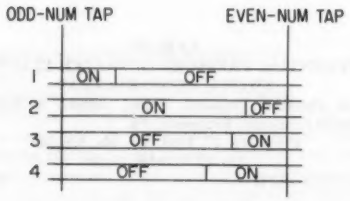
4,520,246

ON-LOAD TAP CHANGER OF THE TYPE OF VACUUM SWITCHES

Toshio Yoshii, Hyogo, and Shigeyoshi Furukawa, Kobe, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Oct. 18, 1983, Ser. No. 543,040
Claims priority, application Japan, Jan. 7, 1983, 58-1351
Int. Cl.³ H01N *33/66*
U.S. Cl. 200—144 B **3 Claims**





1. An on-load tap changer having vacuum type switches, comprising:

first vacuum switches for a main contact of which the ends on one side are connected to a plurality of tap selectors, and of which the ends on the other side are commonly connected; and

second vacuum switches for breaking an overload, which are inserted in at least one series circuit consisting of said tap selector and respective of said first vacuum switches for said main contact, which exhibit superior breaking performance to said first vacuum switches for said main contact in said series circuit, which close earlier than said vacuum switches for said main contact, and which open later than said vacuum switches for said main contact.

4,520,247

PENDANT TYPE ELECTRICAL SWITCHING DEVICE

James J. Pancook, Tonawanda, and Otmar M. Ulbing, Fairport, both of N.Y., assignors to Columbus McKinnon Corporation, Amherst, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,217
Int. Cl.³ H01H *9/04, 13/72*
U.S. Cl. 200—298 **11 Claims**

1. An electrical switch apparatus of the type adapted to be suspended by means of a cable comprising a load supporting carrying strand accompanied by electrical conductor members extending from an overhead hoist being controlled thereby, said apparatus comprising in combination:

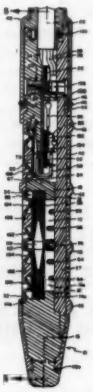
an elongated body member having upper and lower ends and defining an open cavity and apertures communicating with said cavity, said body member being formed of an electrically non-conductive and a relatively stiff resilient material;

a cover plate formed of an electrically non-conductive and relatively stiff resilient material detachably connected to said body member so as to cover said cavity opposite to said apertures, said body member and said cover plate cooperating to provide a peripherally extending mounting groove arranged intermediate said apertures and said upper end of said body member;

switching mechanisms positioned within said cavity in alignment with said apertures and detachably connected electrically to said conductor members;

means for detachably connecting said upper end of said body member to depend from said carrying strand; and

generally tubular shaped upper and lower sheath members formed of an electrically non-conductive and highly resilient material removably fitted over said upper and lower ends of said body member to cover said body member and said cover plate in a waterproof and electrically insulated manner with adjacent ends of said sheath members being arranged in a lapped relation above said mounting groove, said lower sheath member having portions thereof arranged in alignment with said apertures serving to define buttons adapted for manual depression for selectively operating said switching mechanisms, said lower sheath member having an internal flange portion removably received within said mounting groove and having an outwardly facing peripheral groove to provide a locking depression for receiving a lapped end of said upper sheath member retained in place by an elastic ring extending peripherally thereof, and said upper sheath member having an extended tubular shaped end portion slide-fitted



about said cable in moisture sealing relation therewith and operating to brace said cable against sharp bends adjacent to said body member.

6. An electrical switch apparatus of the type adapted to be suspended by means of a cable from an overhead hoist to be controlled thereby, said switch apparatus comprising in combination:

a body member formed of an electrically non-conductive and relatively stiff resilient material having a cavity and a pair of apertures opening into said cavity;

sheath means formed of an electrically non-conductive and highly resilient material enclosing said body member and defining push-operated buttons aligned one with each of said apertures;

an elongated resiliently deformable electrical contact member supported by its opposite ends to extend lengthwise thereof within said cavity and transversely in alignment with said apertures; a current supply bar arranged in said cavity for engagement with said contact member adjacent a mid-point thereof, said supply bar being disposed intermediate said buttons and on a side of said contact member spaced from said buttons; and two pairs of electrical contacts supported within said cavity in alignment one pair with each of said buttons and on a side of said contact member spaced from said buttons, and each of said buttons when pressed upon to a first degree being operable to

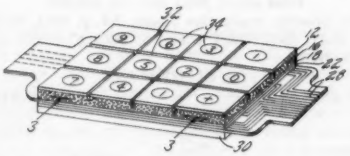
deform said contact member transversely thereof into engagement with a first contact of an aligned one of said pairs of contacts and when pressed upon to a further degree, further deforming said contact member into engagement with a second contact of said aligned one of said pairs of contacts.

4,520,248

KEYBOARD ASSEMBLY

Robert Woelfel, Palatine, Ill., assignor to Rogers Corporation, Rogers, Conn.

Filed Aug. 15, 1980, Ser. No. 178,471
Int. Cl.³ H01H *13/14*
U.S. Cl. 200—340 **28 Claims**



1. A membrane type keyboard comprising:

switch array means, said switch array means including means defining a plurality of pairs of cooperating electrical contacts, the contacts of each pair being in registration and spatially separated to define normally open switches, at least a first of said contacts of each pair being supported on the first surface of a common flexible insulating substrate whereby the switches of said array means may be selectively closed by urging contact supporting portion of the flexible insulating substrate in the direction of cooperating contacts in registration therewith;

a layer of resilient foam material overlying and having a first surface bonded to with the second side of said flexible insulating substrate, said layer of resilient material having a second surface with a pattern of cuts or slits formed therein to define a plurality of key regions, the key regions being areas of the full thickness of said layer of foam material bounded and spaced from one another by areas of partial thickness of said resilient foam, said areas of partial thickness defining the periphery of key regions which are in registration with the pairs of cooperating contacts of said switch array means; and

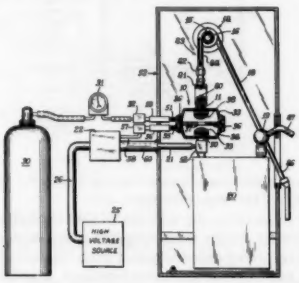
indicia providing means, said indicia providing means being adhered to the second surface of said layer of resilient material, said indicia providing means being sheet means having a pattern of cuts or slits commensurate, with the pattern of cuts or slits in said foam material, said indicia means forming labels for each of said key regions whereby the exertion of an actuating force having a component in a direction perpendicular to said second surface of said layer of resilient material will result in compression of said resilient material and the subsequent deformation of said flexible substrate to thereby close a switch of said array.

4,520,249

METHOD OF AND APPARATUS FOR SELECTIVE LOCALIZED DIFFERENTIAL HYPERTHERMIA OF A MEDIUM

George H. Czerlinski, Skokie, Ill., assignor to Submicron, Inc., Chicago, Ill.

Division of Ser. No. 86,262, Oct. 12, 1979, Pat. No. 4,369,345, which is a division of Ser. No. 853,269, Nov. 21, 1977, abandoned. This application Sep. 16, 1982, Ser. No. 418,644
The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.
Int. Cl.³ H05B *6/10*
U.S. Cl. 219—10.49 R **5 Claims**



1. Apparatus for inducing a localized temperature rise in a medium comprising: means for generating an alternating magnetic field applied to at least a portion of said medium, said field having a predetermined frequency; a quantity of magnetizable particles dispersed in said portion of said medium at a known concentration, said particles being selected to have a Curie point approximately one-half the desired temperature rise above the ambient temperature of said medium, said portion of said medium being the region of desired temperature rise, said particles having a mean radius the square of which radius being inversely related to said frequency of said magnetic field, thereby to maximize the coupling of magnetocaloric heating of particles to the dissipative, irreversible heat loss from said particles to the neighboring local areas of said medium.

4,520,250

HEATING APPARATUS OF THAWING SENSOR CONTROLLED TYPE

Masahiro Ishihara; Mitsuru Watanabe; Shuji Ohkawa; Shunichi Taguchi, all of Yokohama, and Itsuo Kikuchi, Ibaraki, all of Japan, assignors to Hitachi Heating Appliances Co., Ltd., Chiba, Japan

Filed Feb. 18, 1983, Ser. No. 467,814
Claims priority, application Japan, Feb. 19, 1982, 57-25603; Jul. 7, 1982, 57-118007
Int. Cl.³ H05B *6/68*
U.S. Cl. 219—10.55 B **29 Claims**

1. A heating apparatus of thawing sensor controlled type comprising:

a heating cavity;

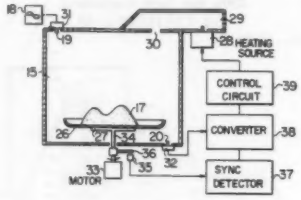
heating means for heating an object to be heated placed in said heating cavity;

transmitting antenna means disposed at a suitable position in said heating cavity for radiating a high-frequency wave signal;

means for supplying high-frequency energy to said transmitting antenna means;

receiving antenna means disposed in said heating cavity at a position suitably spaced apart from said transmitting antenna means for receiving the wave signal transmitted from said transmitting antenna means;

control means for controlling the operation of said heating means on the basis of the wave signal received by said receiving antenna means, said control means operating to control said heating means when the rate of variation of the level of the wave signal, which is received by said receiving antenna means and varies as said object being heated by said heating means is progressively thawed from its initial frozen state, satisfies a predetermined condition;



a turntable disposed in said heating cavity for rotation while carrying the object thereon; and

means for sensing the rotation of said turntable;

said control means measuring the wave signal received by said receiving antenna means each time said rotation sensing means senses a predetermined angular position of rotation of said turntable.

4,520,251

METHOD FOR OPERATING A PROGRAMMABLE MICROWAVE HEATING APPARATUS WITH FOOD DEFROSTING CONTROL

Seiki Yokozeki, Yamatokoriyama, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

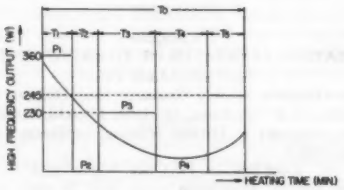
PCT No. PCT/JP81/00321, § 371 Date Jul. 9, 1982, § 102(e) Date Jul. 9, 1982, PCT Pub. No. WO82/01800, PCT Pub. Date May 27, 1982

Continuation of Ser. No. 403,589, Jul. 9, 1984, abandoned. This PCT application Nov. 6, 1981, Ser. No. 606,553

Claims priority, application Japan, Nov. 10, 1980, 55-158594

Int. Cl.³ H05B *6/68*

U.S. Cl. 219—10.55 M **4 Claims**



1. A method for optimally defrosting food in a high frequency heating appliance, said appliance comprising:

a heating chammber for receiving food therein;

a high frequency oscillator for supplying a high frequency energy output to said heating chamber;

a microcomputer for storing information and for controlling said high frequency energy output of said high frequency oscillator in response thereto;

a plurality of keys for inputting information into said microcomputer;

a display operatively connected to said microcomputer for displaying information stored therein;

said method comprising the steps of:

storing a plurality of heating times in said microcomputer, each of said heating times corresponding to a weight of a particular food which has been previously stored by food type in said microcomputer, wherein each of said heating times is divided into five consecutive time slots T_1, T_2, T_3, T_4, and T_5;

storing in said microcomputer respective levels of the high frequency energy outputs of said high frequency oscillator P_1, P_2, P_3, P_4, and P_5, wherein said levels P_1–P_5 are arranged so as to respectively correspond to said slots T_1–T_5 and levels are arranged such that said levels P_1–P_5 are optimum for defrosting said particular food of said weight and such that $P_1 > P_5 \geqq P_3 > P_4 \geqq P_2$;

and, when an operator enters a weight of a particular food type into said microcomputer via said plurality of keys, controlling said high frequency energy oscillator with said microcomputer so as to operate in accordance with said corresponding heating times and high frequency energy level outputs which have been previously stored in said microcomputer so as to thereby optimize the defrosting of said food;

wherein said heating time and high frequency outputs are adjusted such that a surface temperature of said food does not exceed a predetermined final finishing temperature during its defrosting.

4,520,252

TRAVELING-WIRE EDM METHOD AND APPARATUS WITH A COOLED MACHINING FLUID

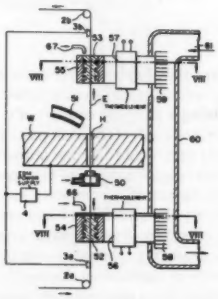
Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

Filed Jul. 6, 1982, Ser. No. 395,633

Claims priority, application Japan, Jul. 7, 1981, 56-106691; Sep. 3, 1981, 56-131880[U]; Apr. 6, 1982, 57-56839; Jun. 18, 1982, 57-104788

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 M **31 Claims**



1. A method of machining a workpiece by electroerosion with a continuous wire electrode wherein the wire electrode is axially displaced to traverse the workpiece between a pair of wire supporting members while defining a machining gap in an opening being developed in the workpiece, a machining fluid is injected into the workpiece opening from at least one nozzle means adjacent to the workpiece, and electrical discharges are effected between the traveling wire electrode and the workpiece across the machining gap to electroerosively remove material from the workpiece, the method comprising the steps of:

(a) providing a deionized water machining fluid in a liquid state having a specific resistance ranging between 5×10^3 and 5×10^5 ohm-cm in supply conduit means connected to said nozzle means;

(b) cooling, in said conduit means, said deionized water machining fluid to a cooled liquid state of less than a predetermined temperature; and

(c) pumping said deionized water machining fluid in the cooled liquid state to feed it without substantial tempera-

ture rise via said nozzle means into said workpiece opening.

4,520,253

WIRE-CUT ELECTRIC DISCHARGE MACHINE CONTROL SYSTEM TO COMPENSATE FOR WIRE FLEXURE DURING MACHINING

Gotaro Gamo; Mitsuo Kinoshita, both of Hachioji, and Haruki Obara, Sagamihara, all of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

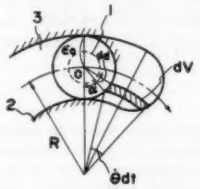
PCT No. PCT/JP81/00422, § 371 Date Aug. 26, 1982, § 102(e) Date Aug. 26, 1982, PCT Pub. No. WO82/02356, PCT Pub. Date Jul. 22, 1982

PCT Filed Dec. 28, 1981, Ser. No. 414,364

Claims priority, application Japan, Dec. 30, 1980, 55-186737

Int. Cl.³ B23P *1/08*

U.S. Cl. 217—69 W **3 Claims**



1. A method of controlling a wire-cut electric discharge machine to apply a voltage between a wire electrode and a workpiece of relatively uniform thickness for cutting a corner of the workpiece with electric discharge energy while the wire electrode and the workpiece are being moved relative to each other based on cutting command data including commanded radius data to thereby cut the workpiece to a predetermined shape, said method comprising the steps of:

(a) storing data Do on an amount of flexing of the wire electrode as measured upon rectilinear cutting before the actual corner machining operation;

(b) calculating an amount of flexing D_T of the wire electrode in a tangential direction to the path along which the workpiece is cut by the wire and an amount of flexing D_R of the wire electrode in a radial direction to the path along which the workpiece is cut by the wire on the base of said data Do;

(c) calculating a corrected radius of curvature R_1 of a corner to be cut on the basis of said amount of flexing D_T and said amount of flexing D_R; and

(d) moving the wire electrode and workpiece with respect to each other along an arc determined by the corrected radius of curvature R_1 of the corner for electric discharge cutting of the workpiece.

4,520,254

METHOD AND APPARATUS FOR THE ADJUSTMENT OF CONTACT SPRINGS IN A RELAY

Erwin Steiger, and Bernhard Hering, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,454

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1982, 3235714

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 L **26 Claims**

1. A method of adjusting contact springs in a relay by the localized application of metered heat from a laser pulse, to produce a specific change in the position of the contact springs, comprising the steps of:

(a) selecting individual points of a matrix field on the surface of a contact spring;

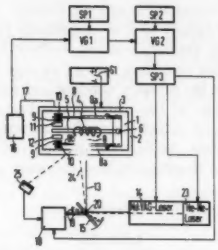
(b) irradiating said points with a heat pulse of predetermined energy, length and focus diameter;

(c) obtaining the correction values for the position of a contact spring when said points are irradiated;

(d) storing said correction values in a memory;

(e) measuring the position of said contact spring in comparison to a desired value;

(f) computing the deviation between said measured value and said desired value;



(g) comparing said deviation with said stored correction values;

(h) selecting those correction values whose resultant most closely corresponds to said deviation;

(i) controlling matrix points on said contact spring surface which correspond to said selected correction values; and

(j) irradiating said controlled matrix points with a predetermined heat pulse.

4,520,255

HIGH FREQUENCY SELF-OSCILLATING WELDING APPARATUS

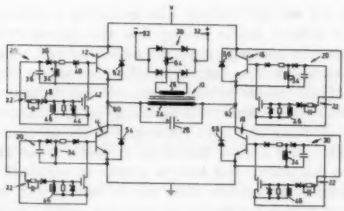
Gordon L. Bredenkamp, Roodepoort, and Pierre Van Rhyn, Florida Park, both of South Africa, assignors to Crucible Societe Anonyme, Luxembourg, Luxembourg

Filed Jun. 21, 1983, Ser. No. 506,347

Claims priority, application South Africa, Jun. 22, 1982, 82/4395

Int. Cl.³ B23K *9/10*

U.S. Cl. 219—130.1 **4 Claims**



1. Welding apparatus which comprises first and second switching elements in series, third and fourth switching elements in series, the first and second switching elements, and the third and fourth switching elements, being respectively connected in parallel to a power supply in a circuit for operating in a load dependent self-oscillatory manner under the full supply voltage without voltage doubling effect, a transformer, the transformer having a primary winding, and a secondary winding from which welding current is drawn, the primary winding being connected between the connection points of the first and second switching elements, and the third and fourth switching elements, respectively, and self-oscillatory switching means arranged in the circuit for operating in such load

dependent manner and which includes means coupled to the primary winding for turning the switching elements on, and first, second, third and fourth sensing means associated respectively with the first, second, third and fourth switching elements, each sensing means sensig the voltage across at least part of the respective switching element while it is on, and including voltage regulator means and electronic switch means initiating the switching off of the said switching element if the voltage is above a predetermined level, whereby the first and fourth switching elements, and the second and third switching elements, are alternately turned on, thereby to cause current from the power supply to flow alternately in opposite directions through the primary winding without voltage doubling effect, and further including energy storage means which is connected across the primary winding and which establishes a circulating current in the primary winding and the energy storing means, and which thereafter returns energy to the power supply when the first and second switching elements, and the third and fourth switching elements, respectively, are turned off.

4,520,256

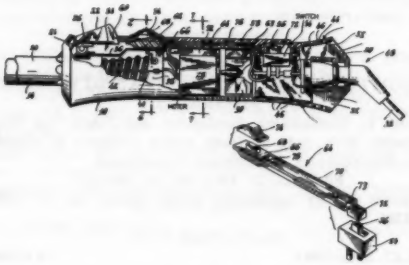
HOT AIR CURLER HAVING A REMOTE AIR INLET AND A SLIDE SWITCH AND ACTUATING ARM WITHIN ITS HANDLE

Edward J. Doyle, Hatboro, Pa., assignor to Conair Corporation, Edison, N.J.

Filed May 16, 1983, Ser. No. 494,997

Int. Cl.³ H05B *1/02;* **A45D** *2/36, 1/04;* **H01H** *15/00*

U.S. Cl. 219—225 **3 Claims**



1. In a hot air hair curling iron including a substantially cylindrical hollow handle having first and second ends and defining air inlet openings adjacent said second end, a substantially cylindrical hollow barrel extending outwardly from the first end of said handle having a proximal end defining an air passage with the interior of said handle, a closed distal end, and a sidewall defining air outlet openings therein, an electric air heater within said hollow handle at its first end, an electric motor and fan within said hollow handle at substantially its central portion, an electric slide switch within said hollow handle, said switch positioned so said slide moves longitudinally to said handle, and an electrical power supply cord terminating in the second end of said housing and electrically connected through said switch to said motor and air heater, the improvement which comprises:

said electric switch being positioned within the second end of said handle;

a switch actuating slide externally mounted on said hollow handle adjacent its first end; and

a rigid actuating arm positioned within said hollow handle for reciprocation parallel to its longitudinal axis, said handle including a longitudinal channel housing said actuating arm therein, and said arm having a first end engaging said slide for movement therewith and a second end in actuating relationship with said switch.

4,520,257

ELECTRONIC NON-USE POWER INTERRUPTION SAFETY DEVICE FOR AN ELECTRIC FLAT-IRON

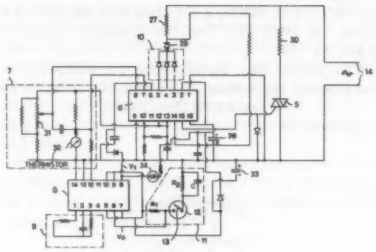
Pierre Schwob, Lyons, and Christian Mieg, Meyzieu, both of France, assignors to SEB S.A., Selongey, France

Filed Jan. 26, 1984, Ser. No. 574,140

Claims priority, application France, Feb. 2, 1983, 83 01601

Int. Cl.³ H05B *1/02;* **D06F** *75/26;* **G08B** *21/00*

U.S. Cl. 219—250 **1 Claim**



1. An electronic safety device for automatically interrupting the supply of electric current to a heating resistor of an iron at the end of the predetermined interval of non-use, said device comprising a movable body which is capable of displacement within a housing of the iron when the iron is being moved, said movable body being adapted to control a position of contacts of an associated switch so that at least one opening-closing sequence of said switch contacts is obtained upon displacements of said movable body, means associated with said switch consisting of a resistor bridge supplied with a rectified voltage E and comprising a resistor **R1** and a resistor **R2** in series with said switch contacts, a capacitor connected to the terminals of said resistor **R2**, there being a voltage Vo at the terminals of said resistor **R1**, the respective values of said resistors **R1** and **R2** being such that said voltage Vo is lower than E/2 when said switch contacts are open or closed and higher than E/2 at the time of transition of said contacts from open to closed position, means to apply said voltage Vo to one input of a counter which is reset to zero each time said voltage Vo is higher than E/2, said counter being connected to an input of a comparator for transmitting a voltage **V1** when said counter attains a predetermined counting threshold, said comparator being connected to a trigger of a triac having one terminal connected to a current supply and another terminal connected in series to said heating resistor, said comparator being adapted to deliver turn-on pulses to said trigger as long as no voltage **V1** is applied and to stop said turn-on pulses as soon as a voltage **V1** is applied to said one input of said comparator, thereby interrupting the current supply to the heating resistor.

4,520,258

SYSTEM CONCOMITANTLY CONTROLLING PASSENGER COMPARTMENT AND ELECTRIC AUXILIARY HEATING IN AUTOMATIC VEHICLES

Kurt Grohmann, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke A.G., Munich, Fed. Rep. of Germany

Filed Apr. 26, 1983, Ser. No. 488,724

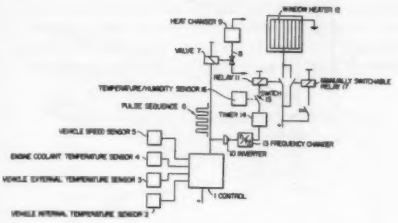
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1982, 3215802

Int. Cl.³ H05B *1/02;* **B60H** *1/00*

U.S. Cl. 219—279 **13 Claims**

1. A heater arrangement for an automotive vehicle, comprising a heating means for heating a passenger compartment of a vehicle, an auxiliary heater means for heating a portion of said vehicle, sensor means for sensing at least one condition influencing the heating of the passenger compartment, and control means for controlling said heater arrangement in response to

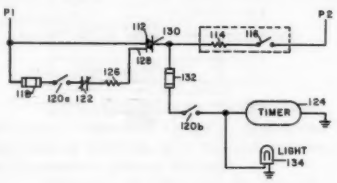
said at least one sensed condition, said control means including means generating a pulse sequence in response to said at least one sensed condition and means responsive to said pulse sequence for controlling operation of said heating means, and means responsive to said pulse sequence for controlling operation of said auxiliary heater means.



4,520,259
ELECTRICAL ENERGY SAVER

Frederick Schoenberger, 175 Antioch Dr., Elyria, Ohio 44035

Filed Feb. 14, 1983, Ser. No. 454,275
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—501 **3 Claims**



1. An energy saving control circuit in an electrical clothes dryer having a rotating clothes tumbler and comprising:

first and second power supply lines;

a bidirectional electronic switch including gate means being connected to said first power supply line;

said bidirectional electronic switch connected in series to an electrical heating element, said electrical heating element terminating in said second power supply line;

said gate means connected to said first power supply line by a first electric switch and a normally open contact in a series connection, said first electric switch closed when a dryer on-off control button is on; and

a timer and electrical timer motor connected intermediate to said bidirectional electronic switch and said electrical heating element by a second electric switch and ground, said second electric switch closed when said dryer on-off control button is on, said timer motor being energized by said second power supply line whereby after a predetermined time, said normally open contact responsive to said timer motor closes resulting in a gating pulse applied to said bidirectional electronic switch rendering said bidirectional electronic switch into conduction, and said heating element being energized by said first and second power supply lines, for a predetermined period of time, thereafter, said timer motor causes said normally open contact to open thereby deenergizing said heating element.

4,520,260
SEMI-CONDUCTIVE HEATING CABLE

Vijayraj M. Kotian, Stow; Roger L. Blumer, Cortland, and William J. Herbert, Mantua, all of Ohio, assignors to Eaton Corporation, Cleveland, Ohio

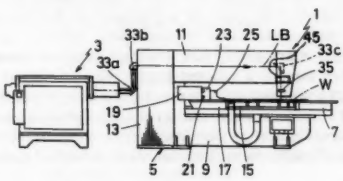
Filed Nov. 2, 1983, Ser. No. 548,189
Int. Cl.³ H05B *3/10*
U.S. Cl. 219—553 **34 Claims**

1. An improved, flexible, self-regulating heating cable of the type having at least one pair of spaced-apart elongate electrical conductors electrically interconnected by means of a semi-conductive composition that is enclosed by electrically insulating jacket wherein the improvement is characterized by said jacket being the radiation crosslinked product of a composition comprising a mixture of: (A) from about 50 parts to about 80 parts by weight to the total weight of the composition of at least one elastomer; (B) from about 20 parts to about 50 parts by weight to the total weight of the composition of a polymer selected from the group consisting of polyethylene polymer, polypropylene, polymer, and blend thereof and; (C) an effective amount by weight to the total weight of the composition of a heat stabilizer, said jacket having the ability to minimize changes in the ambient electrical resistance of the semi-conductive composition and having improved resistance to color change arising from exposure of the cable to radiation and elevated temperature up to and including the annealing temperature of the semi-conductive composition.

4,520,261
DETECTOR FOR THE DEVIATION OF THE OPTICAL AXIS IN LASER PROCESSING APPARATUS

Akira Tsutsumi, La Mirada, Calif., assignor to Amada Company, Limited, Japan

Continuation of Ser. No. 299,189, Sep. 2, 1981, abandoned. This application Apr. 9, 1984, Ser. No. 597,568
Claims priority, application Japan, Sep. 2, 1980, 55-124058[U]
Int. Cl.³ G01J *1/20*; B23K *9/00*
U.S. Cl. 250—203 R **9 Claims**



1. A laser processing device for cutting a workpiece with a laser beam and detecting the amount of deviation of the optical axis of the laser beam from a predetermined point at which the workpiece is to be processed in said laser processing device, comprising:

(a) means for producing a laser beam capable of cutting a workpiece;

(b) an X-axis carriage and a Y-axis carriage, and X-axis carriage movable in the direction of the X-axis along the Y-axis carriage which is movable in the direction of the Y-axis.

(c) a work clamp provided on said X-axis carriage, said work clamp adapted to hold one of a workpiece and a deviation detecting means, said detecting means comprising a plurality of image sensing means disposed radially around the predetermined point located on an upper surface of a base plate for generating signals, and means for displaying said signals from the sensing means for indicating the optical axis of the laser beam irradiated from the laser beam producing means to at least three of the plurality of image sensors;

whereby the workpiece may be exchanged for the deviation

detecting means and said carriages may be adjusted so that the optical axis of the laser beam coincides with the predetermined point at which the workpiece is to be processed.

4,520,262

PHOTOELECTRIC SAFETY SCREEN WITH STRAY SOURCE DETECTION

Anthony D. Denton, Adelaide, Australia, assignor to Kenneth Ambler and Willy Raeder, both of Highbury, Australia

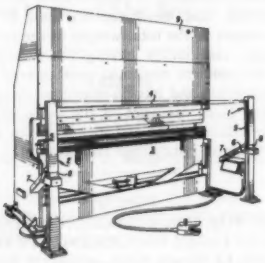
Continuation of Ser. No. 261,170, filed as PCT AU 80/00063, Sep. 10, 1980, published as WO 81/00750, Mar. 19, 1981, § 102(e) date Apr. 30, 1981 abandoned.

This application Dec. 6, 1983, Ser. No. 558,603

Claims priority, application Australia, Jun. 10, 1980, 0423/79

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—221 **3 Claims**



1. A method of detection of opaque members when within a detection space, comprising the steps of sequentially effecting a radiant energy transmission across a detection space from a plurality of spaced apart transmission sources and generating a detection observed signal when such transmission is not sufficiently detected by each of a plurality of correspondingly located and sequentially corresponding selected detection means; and interrogating said detection means at times other than when there is a selected transmission of radiant energy from said transmission source and generating a stray source signal if sufficient radiant energy is then detected, said stray source signal indicating the presence of extraneous radiation or a failure of said transmission sources or detection means.

4,520,263

COLLATOR WITH PHOTOELECTRIC BIN FILL DETECTION

Takashi Kitamura, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 14, 1981, Ser. No. 311,447

Claims priority, application Japan, Oct. 21, 1980, 55-147085; Oct. 22, 1980, 55-148657; Oct. 23, 1980, 55-149065; Dec. 22, 1980, 55-182468; Dec. 22, 1980, 55-182467; Dec. 27, 1980, 55-186522

Int. Cl.³ G01V *9/04*

U.S. Cl. 250—223 R **10 Claims**

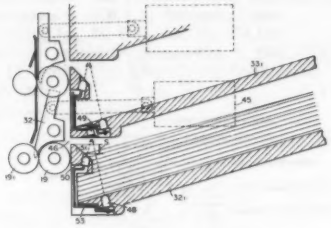
1. A collator comprising:

a plurality of bin members capable of stacking sheets;

a first light-emitting element for detecting an empty bin, which is disposed at a bottom of a sheet stacking section of each of said bin members;

a second light-emitting element for detecting a full bin, which is disposed near a sheet insertion inlet of each of said bin members; and

a common light-receiving element which is disposed at a bottom of an adjacent bin member and which receives light emitted from said first light-emitting element for detecting an empty bin and from said second light-emitting element for detecting a full bin, said light-receiving



element being disposed obliquely to said second light-emitting element.

4,520,264

ELECTRON MICROSCOPE

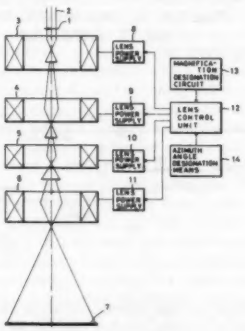
Katsushige Tsuno, and Toshikazu Honda, both of Akishimashi, Japan, assignors to JEOL Ltd., Tokyo, Japan

Filed Apr. 7, 1983, Ser. No. 482,880

Claims priority, application Japan, Apr. 8, 1982, 57-59432; Apr. 23, 1982, 57-68258

Int. Cl.³ H01J *37/26, 37/141*

U.S. Cl. 250—311 **7 Claims**



7. A method of rotating the image of a transmission electron microscope having an objective lens, at least two intermediate lenses and a projector lens comprising the steps for

(a) adjusting the magnetomotive forces in two intermediate lenses to oppose and

(b) adjusting the absolute value of the magnetomotive forces in the two intermediate lenses and the projector lens such that the image rotates without a substantial change in magnification.

4,520,265

METHOD AND APPARATUS FOR ACCURATE REMOTE MONITORING OF GASES

Michael Griggs, San Diego; Laurence L. Acton, La Jolla, assignor to Southern California Gas Co., Los Angeles, Calif. and Gordon D. Hall, San Diego, all of Calif.

Filed Sep. 6, 1983, Ser. No. 529,576

Int. Cl.³ G01J *1/00*

U.S. Cl. 250—338 **14 Claims**

1. Apparatus for accurate remote monitoring of the concentration of a target gas, which includes;

first and second gas filter correlation channels both operat-

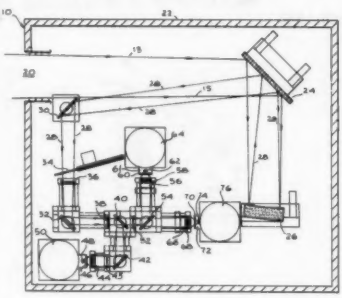
ing at a first spectral wavelength and each having an output terminal;

differential amplifier means having first and second input terminals coupled to respective ones of said output terminals of said first and second gas filter correlation channels for producing a first output signal which represents the target gas but requires correction for ambient conditions;

a corrective channel operating at a second spectral wavelength substantially different from said first spectral wavelength for producing a second output signal representative of said ambient conditions;

signal multiplying means coupled to said differential amplifier means and to said corrective channel for multiplying said first and second output signals to produce a target-gas concentration signal, said pair of gas filter correlation channels and said corrective channel being optically aligned to receive radiant energy from a common source region; and,

means to utilize said gas concentration signal.



4,520,266

RADIATION LEVEL DETECTORS

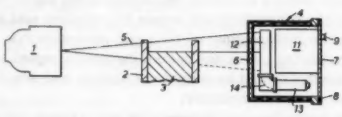
Edwin Fletcher, Rotherham; Gerald V. Beaton, and Charles R. Gomer, both of Sheffield, all of England, assignors to British Steel Corporation, London, England

Filed Sep. 15, 1982, Ser. No. 418,425

Claims priority, application United Kingdom, Sep. 18, 1981, 8128235; Feb. 19, 1982, 8204956

Int. Cl.³ G01F *23/00*

U.S. Cl. 250—357.1 **9 Claims**



1. Apparatus for monitoring the free surface position of a fluid present within a container which is dense to particular ionising radiations, comprising a detector head adapted to be located to one side of the container and to receive ionising radiations from a compact radioactive source positioned on the other side of the container, the detector head including a casing which houses a radiation sensitive phosphor scintillator of sufficient length to span the range of fluid surface positions to be monitored, a photo-multiplier optically coupled to the scintillator, and an electronic module connected to receive pulsed high-impedance electrical signals from the photo-multiplier proportional to the intensity of the radiation incident on the phosphor scintillator and to transform such signals to produce at an outlet terminal of the detector head low tension electrical current which is linearly proportional to the level of radiation received by the scintillator and representative of the free surface position of the fluid within the container.

4,520,267

METHOD AND APPARATUS FOR ANALYZING ORE BY MEANS OF GAMMA RADIATION

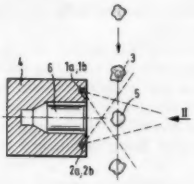
Heikki Sipilä ; Erkki Kiuru, and Seppo Vaijärvi, all of Espoo, Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Sep. 11, 1981, Ser. No. 301,196

Claims priority, application Finland, Sep. 15, 1980, 802882

Int. Cl.³ G01N *23/00*

U.S. Cl. 250—358.1 **10 Claims**



1. A method for analysing pieces of ore for the purpose of sorting, comprising

irradiating the pieces individually by means of two gamma radiation sources, each operating at a different energy level, the energy levels of the sources having been selected so that, as to scattering, in one the Compton effect is predominant and in the other the Compton effect and the photoelectric effect compete with each other, the photoelectric effect being strongly dependent on the ordinal number of each element present in the ore; and

detecting by means of at least one detector the intensities of the scatter produced from said piece by the said two sources of radiation and comparing the detected intensities with each other in order to determine the proportion of heavy elements present in the piece.

4,520,268

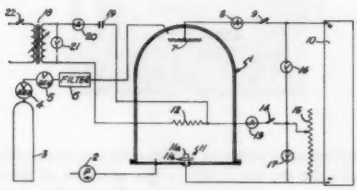
METHOD AND APPARATUS FOR INTRODUCING NORMALLY SOLID MATERIALS INTO SUBSTRATE SURFACES

Zhong Xu, Columbia, S.C., assignor to Pauline Y. Lau and Roland L. Lau, both of Columbia, S.C.

Filed May 26, 1983, Ser. No. 498,313

Int. Cl.³ G21K *5/00*

U.S. Cl. 250—492.1 **28 Claims**



1. The method for introducing into an electrically conductive substrate at least one normally solid material selected from the group consisting of metals and metalloids, the method producing an alloy of the at least one normally solid material penetrating below the surface of the substrate, the method comprising the steps of:

providing a closed chamber in which the atmosphere and pressure can be controlled and which includes an anode;

positioning the substrate as a cathode with the surface of the

substrate exposed to the interior of the chamber and spaced from the anode;

providing a source electrode comprising a body of the material to be introduced into the substrate,

said body being exposed within the chamber in a location spaced from the anode and the substrate;

evacuating the chamber and establishing therein an atmosphere of inert gas at a pressure not exceeding 10 torr;

establishing a direct current potential difference between the anode and the cathode and a direct current potential difference between the anode and the source electrode to cause a double glow discharge with one glow discharge occurring between the anode and cathode and the other between the anode and the source electrode and maintaining the double glow discharge for a time period of at least 15 minutes; and

maintaining the surface portion of the substrate at an elevated temperature not exceeding the deformation point of the substrate and maintaining said body of material at a temperature equal to at least 40% of the melting point of the material but below the boiling point of the material,

said temperatures being maintained throughout said time period;

the double glow discharge causing said body of material to be bombarded by ions of the inert gas of the atmosphere with resultant heating of said body and ejection of positive ions of the material of said body from said body,

the positive ions so ejected travelling to the substrate and vigorously bombarding the exposed surface of the substrate as a result of the difference in charge between the positive ions and the substrate, such bombardment causing the metal ions to penetrate the exposed surface of the substrate and permeate a portion of the heated substrate below said surface to thereby form said alloy penetrating below the surface of said substrate.

4,520,269

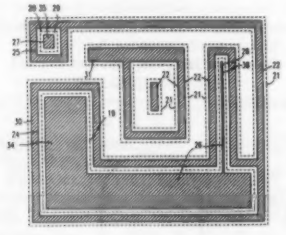
ELECTRON BEAM LITHOGRAPHY PROXIMITY CORRECTION METHOD

Fletcher Jones, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 3, 1982, Ser. No. 439,241

Int. Cl.³ H01J *3/26*

U.S. Cl. 250—492.2 **19 Claims**



1. A method of modifying a lithographic exposure pattern so as to make the exposure pattern less sensitive to proximity effect, the exposure pattern consisting of a plurality of shapes, comprising the steps of:

subdividing the shapes of the lithographic exposure pattern into perimeter parts having a width on the order of the exposure pattern minimum linewidth and central parts, each central part being completely surrounded by a perimeter part; and modifying the exposure pattern by setting back the edges of each central part away from the perimeter part which surrounds it, thereby forming a nominally unexposed band inside of and immediately adjacent to each perimeter part having a central part, the nominally unexposed band acting to reduce electron scattering outside of the perimeter part adjacent thereto.

4,520,270

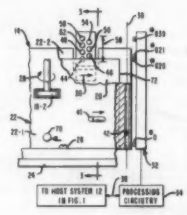
SELF-ADJUSTING SENSOR CONTROLLER

Rudolf Enter, Kitchener, and Michael P. Laverty, Waterloo, both of Canada, assignors to NCR Canada Ltd - NCR Canada Ltee, Mississauga, Canada

Filed Sep. 30, 1982, Ser. No. 431,922

Int. Cl.³ G01H *21/86*

U.S. Cl. 250—560 **7 Claims**



4. An apparatus comprising:

a plurality of photodetectors arranged in a dimension-detecting direction with reference to a selected dimension of an object, and a source of light for each said photodetector, which said source of light is positioned for light coupling relationship with its associated said photodetector when the associated source of light is energized to enable said source of light and associated said photodetector to function as a light-detector pair; and

a circuit for adjusting to the sensitivity of each said photodetector and for determining said selected dimension of an object positioned between said photodetectors and said sources of light and as measured along said dimension-detecting direction, comprising:

a sensor controller having means for selecting a said source of light to be energized to provide a light-coupling relationship with the associated said photodetector; each said photodetector having a terminal at which an open-condition voltage is developed for an open condition i.e. when no object is between said photodetector and the associated said source of light and at which a blocked condition voltage is developed for a blocked condition i.e. when an object is between a said photodetector and the associated said source of light;

a comparator having inverting and noninverting inputs thereto and an output therefrom and means for coupling said inverting input to said terminal of each said photodetector;

a digital to analog converter having its input coupled to said sensor controller and its output coupled to said non-inverting input of said comparator;

said sensor controller having means for ascertaining said open-condition voltage for each said photodetector in cooperation with said selecting means, said comparator and said converter; said sensor controller also having a memory in which a test value is stored for each said photodetector; each said test value corresponding to a predetermined fraction of said open condition voltage for the associated said photodetector;

said sensor controller in cooperation with said selected means, issuing sequentially a said test value to said converter which supplies a corresponding voltage to said non-inverting input of said comparator to enable said comparator to generate first and second signals corresponding to said open condition and to said blocked condition, respectively, for each said photodetector in said plurality of photodetectors, with the number of said photodetectors in said blocked condition being a measure of said selected dimension of said object.

4,520,271
STOP-START DEVICE FOR A MOTOR VEHICLE ENGINE

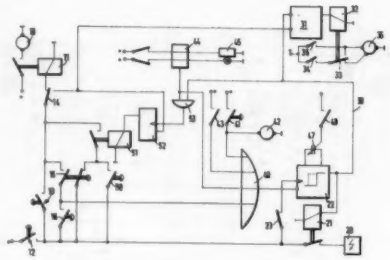
Horst Goertler, Sachsenheim, and Horst Rachner, Bietigheim-Bissingen, both of Fed. Rep. of Germany, assignors to ITT Industries, Inc., New York, N.Y.

Filed Dec. 10, 1982, Ser. No. 448,728

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209794

Int. Cl.³ F02N *11/08*

U.S. Cl. 290—38 C **5 Claims**



1. A stop-start device for a motor vehicle engine comprising a starting circuit for starting the engine, which comprises at least one start button bridging a starter switch, and comprising a switching member whose switching condition for switching off the engine is variable through a stop button and/or through a road-speed-dependent switch, characterized in that with the change of the switching condition of the switching member particular consumers in the motor vehicle are changed over to a mode of operation with a lower current consumption;

wherein the revolutional speed of the electric motor for a power-assisted braking system or steering system is reduced;

wherein upon switching on the engine again the mode of operation adjusted through the operating switch **(34)** of the consuming device **(35)** before switching off is again turned on;

wherein the switching condition of the switch member **(21)** may be affected by further switching elements **(41, 43, 44)** which are controlled in dependence on particular operating conditions on the motor vehicle and, when these particular operating conditions exist, prevent a change in the switching condition of the switching member **(21)** irrespective of the stop button and/or the road-dependent switch **(23)** being actuated;

wherein further switching elements are dependent on the operating conditions of the engine and especially in the case of a too high oil temperature and/or a too high cooling water temperature a switching-off of the engine is prevented; and,

in which the switching member is controlled via a delay circuit in dependence on a road-speed dependent switch, and wherein the delay time of the delay circuit **(22)** may be affected in dependence on the switching position of particular switch elements **(48)**.

4,520,272
ENGINE SPEED REGULATING SYSTEM

Yoshiaki Danno; Hiroyuki Kobayashi, and Toyoaki Fukui, all of Kyoto, Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

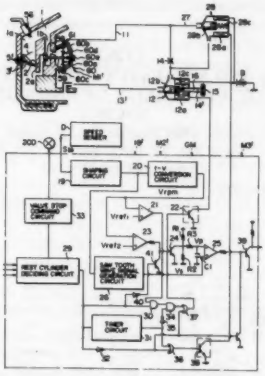
Filed Jan. 26, 1983, Ser. No. 461,178

Claims priority, application Japan, Jan. 30, 1982, 57-13979; Dec. 3, 1982, 57-212188

Int. Cl.³ F02M *3/00;* **H02P** *9/04*

U.S. Cl. 290—40 A **28 Claims**

1. An engine speed regulating system for an engine having a plurality of cylinders comprising a generator driven by the engine for charging a battery, speed detecting means for detecting the speed of said engine, a generator control means which, when the speed of said engine becomes lower than a preset speed which is not higher than an idling speed of said engine, outputs a control signal for controlling power generation of said generator on the basis of a signal supplied from said speed detecting means, a cylinder stop means associated with part of said plural cylinders for stopping the operation of the associated said part of said cylinders, a cylinder number con-



trol means which provides to said cylinder stop means a control signal for switching between an engine operation with all of the cylinders of said engine working and an engine operation in which said part of the cylinders is not in operation while the remainder of the cylinders is in operation, and an operation control means for controlling the operation of said generator control means in response to the operation of said cylinder number control means, said operation control means being operable to make said generator control means operate when the engine operates with said part of the cylinders.

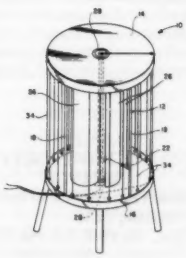
4,520,273
FLUID RESPONSIVE ROTOR GENERATOR

Raymond A. Rowe, Encinitas, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1983, Ser. No. 533,334

Int. Cl.³ F03B *13/10*

U.S. Cl. 290—54 **16 Claims**



1. A rotor generator which is adapted to be operated in a moving fluid environment comprising:

a rotor which has a plurality of blades;

each blade including magnetized means;

a plurality of conducting wires;

framework means arranging the conducting wires about the rotor, for location in the moving fluid environment with the wires extending substantially perpendicular to the prevailing direction of fluid flow;

the framework means also arranging the wires with spaces therebetween so that moving fluid will impinge on the blades;

means for rotatably mounting the rotor within the framework so that moving fluid will rotate the rotor and cause electrical current to be induced in the conducting wires; and

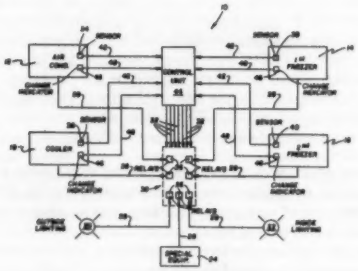
means for collecting the induced electrical current so that the electrical current can be provided for power purposes.

4,520,274

METHOD AND APPARATUS FOR CONTROLLING THE LOADS OR A PLURALITY OF UNITS ON A SHARED SOURCE

Richard O. Stants, 1508 Pontiac Dr., Kokomo, Ind. 46902

Filed Jul. 22, 1983, Ser. No. 516,388
Int. Cl.³ H02J *3/14*
U.S. Cl. 307—39 **17 Claims**



1. A method for controlling the loads of a plurality of units on a shared source, comprising the steps of: setting for each said unit a nominal value of an operating parameter responsive to said load, connecting each said unit to said source, keeping each connected said unit connected to said source for a connection period for that individual said unit, disconnecting each connected said unit from said source following said connection period, keeping each said unit disconnected from said source for a disconnection period for that individual said unit, determining for each said unit, while said unit is not connected to said source, an adjustment value of the approximate relative difference over time between said nominal value of said unit's said operating parameter and the actual value of said unit's said operating parameter, adjusting for each said unit the difference in relative lengths of said disconnection period and said connection period in proportion to said adjustment value for said unit, and sequentially repeating said connecting, connected keeping, disconnecting, disconnected keeping, determining, and adjusting steps.

4,520,275

MASTER AND SLAVE POWER SUPPLY CONTROL CIRCUITS

C. Lee Marusik, Allen, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

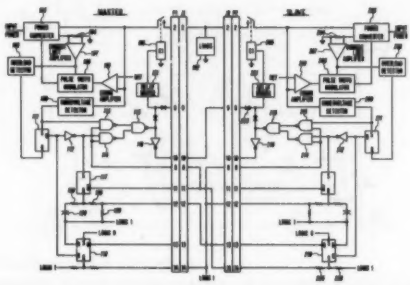
Filed Dec. 28, 1983, Ser. No. 566,358
Int. Cl.³ H02G *9/00*
U.S. Cl. 307—64 **3 Claims**

1. A circuit for controlling the connection of master and slave power supplies to a load, comprising:

means for connecting said master supply to said load and disconnecting said slave supply from said load, under no-fault conditions;

means for responding to an undervoltage condition at said master supply to disconnect said master supply from said load and connect said slave supply thereto, and further, upon cessation of said undervoltage condition, for connecting said master supply to said load and disconnecting the slave supply therefrom;

latching means, responsive to the occurrence of both overload and undervoltage conditions at said master supply, for disconnecting said master supply from said load and connecting said slave supply thereto, and preventing the connection of said master supply to said load and disconnection of said slave supply therefrom, upon the cessation



of said overload condition or said undervoltage condition at said master supply;

means for detecting the occurrence and cessation of a concurrent overload and undervoltage condition at said slave supply; and

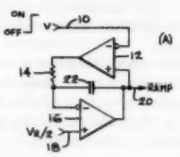
means for responding to the detection of the cessation of said concurrent overload and undervoltage condition at said slave supply to enable said latching means to connect said master supply to said load and disconnect said slave supply therefrom, provided that a concurrent overload and undervoltage condition is not present at said master supply.

4,520,276

ZERO-DELAY RAMP GENERATOR

Jay S. Baker, San Carlos, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,901
Int. Cl.³ H03K *4/08*; G06G *7/18*
U.S. Cl. 307—228 **12 Claims**



1. A circuit for generating a ramp output comprising:

means for supplying a ramp on/off signal; error amplifier means

receiving the ramp on/off signal for initiating and stabilizing the ramp output;

integrator means for generating ramp output coupled at its inverting input to the error amplifier means output, and at its ramp output back to the error amplifier means input; and

reference voltage means coupled to the non-inverting input

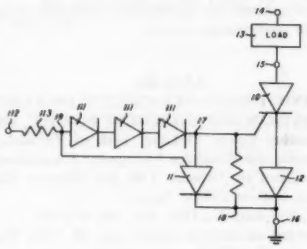
of the integrator means for determining the extent of the ramp output independently of the ramp on/off signal.

4,520,277

HIGH GAIN THYRISTOR SWITCHING CIRCUIT

Larry A. Hahn, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed May 10, 1982, Ser. No. 376,461
Int. Cl.³ H03K *17/73*
U.S. Cl. 307—252 C **3 Claims**



1. A switch circuit having substantially equal gain for both turn-on and turn-off amplification for completing a current path from a source of power, through a load, to ground, comprising:

a. a first thyristor, having an anode connected to said load, a cathode, and a gate;

b. at least one diode connected in series between an input signal terminal and the gate of said first thyristor;

c. a second thyristor, having an anode connected to the gate terminal of said first thyristor, a cathode connected to ground, and a gate connected to receive an input signal on said input signal terminal; and

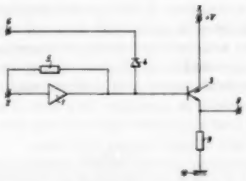
d. a junction diode connected as a load in series between the cathode of said first thyristor and ground to compensate for a voltage differential between the gate of said first thyristor and ground.

4,520,278

ELECTRONIC SWITCH

Minno De Roo, Delft, Netherlands, assignor to Deltakabel B.V., Gouda, Netherlands

PCT No. PCT/NL81/00027, § 371 Date Aug. 18, 1982, § 102(e) Date Aug. 18, 1982, PCT Pub. No. WO82/02301, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 21, 1981, Ser. No. 413,347
Int. Cl.³ H03K *17/74, 17/60, 19/21*
U.S. Cl. 307—253 **4 Claims**



1. An electronic switch controlled by a control signal for switching electrical signals comprising:

(a) an input buffer circuit comprising an input port, an output transistor, and an output port, said input port being excited by said control signal; said output transistor having an internal load resistance substantially equal to that of an open circuit;

(b) a load resistance having first and second electrodes, said first electrode being connected to said input port of said input buffer circuit, and said second electrode being connected to said output port of said input buffer circuit;

(c) diode means comprising first and second electrodes; the first electrode of said diode means functioning as an input terminal for said electronic switch, the second electrode of said diode means being connected to said second electrode of said load resistance and said output port of said buffer circuit, and

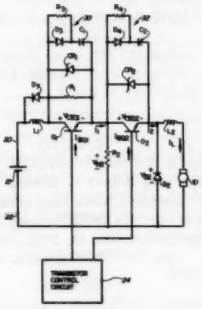
(d) an output buffer circuit comprising first, second and third ports, said first port being commonly connected to said output port of said input buffer, to said second electrode of said load resistance, and to the second electrode of said diode means, second port of said output buffer functioning as an output terminal for said electronic switch, said third port being connected to a voltage potential, said electronic switch being in a substantially open circuit condition when said control signal is at a potential level where the output port of said input buffer circuit has a potential, which reverse bias said diode means, said electronic switch being in a substantially closed circuit condition when said control signal is at a potential level where the output port of said input buffer circuit has a potential which forward biases said diode means.

4,520,279

SERIES TRANSISTOR CHOPPER

Timothy F. Glennon, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 7, 1983, Ser. No. 549,280
Int. Cl.³ H03K *17/60*
U.S. Cl. 307—254 **8 Claims**



1. A transistor chopper circuit for controlling the power delivered to a DC motor from a battery developing a voltage and current and having first and second terminals connected to first and second conductors, respectively, comprising:

first and second transistors each having collector and emitter electrodes, the transistors being connected in series between the battery and the motor, the first transistor being coupled to the first conductor and the second transistor being coupled to the motor, the transistors having turn-on and turn-off times which may differ from one another;

a transistor control connected to the transistors for developing a signal to switch all of the transistors between on and off states to control the power delivered to the motor;

a first resistor connected across the collector and emitter electrodes of the first transistor;

a second resistor connected between the second conductor and the junction between the first and second transistors, the first and second resistors providing a path for the DC current when the transistors are off; and

means connected across the collector and emitter electrodes of the transistors for controlling the voltage across one of

the transistors when the difference in turn-on and turn-off times results in the one transistor being in the off state while the other transistor is in the on state.

4,520,280

APPARATUS FOR DETECTING INPUT SIGNAL

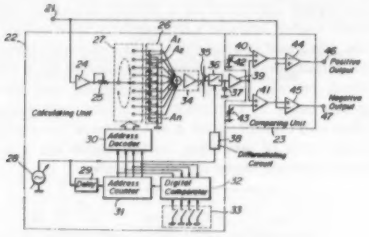
Shozi Yoshikawa; Hiroshi Kodama; Ken Ohsima, all of Hachioji; Masaharu Sakamoto, Tokyo; Kiichi Kato, Hachioji, and Kunio Yamamiya, Tokyo, all of Japan, assignors to Olympus Optical Company Limited, Japan

Filed Aug. 9, 1982, Ser. No. 406,487

Claims priority, application Japan, Aug. 13, 1981, 56-126005

Int. Cl.³ H03K *5/153*

U.S. Cl. 307—358 **12 Claims**



1. An apparatus for detecting an input signal comprising:

means for receiving the input signal and forming a profile signal which resembles a fluctuation of a base line of the input signal;

means for adding said profile signal to upper and lower threshold levels to form upper and lower reference levels; and

means for comparing the input signal with said reference levels to derive output signals when said input signal exceeds the reference levels.

4,520,281

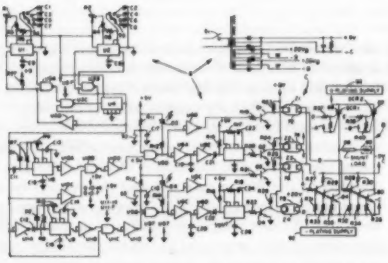
WIDE PULSE RANGE PERIODIC REVERSE UNIT

Ralph R. Green, and Robert C. Green, both of Hiram, Ohio, assignors to Imperial Clevite Inc., Glenview, Ill.

Continuation of Ser. No. 067,971, Aug. 20, 1979, abandoned. This application Feb. 16, 1982, Ser. No. 349,433

Int. Cl.³ H03K *15/082, 15/14*

U.S. Cl. 307—475 **11 Claims**



1. An electrical circuit for generating electrical pulses, said circuit comprising in combination:

a timing and control circuit including means for generating a plurality of wave pulses, said wave pulses including at least a first wave pulse having a first frequency and a second wave pulse having a second frequency, said first frequency being different from said second frequency, means for distinguishing and combining said wave pulses to generate a wave signal, including high side and low side durations in proportion to said first frequency and said second frequency, respectively, means for generating delays at alternations of said wave signal, and means for converting said wave signal to electrical pulses in parallel circuit path with said wave signal;

a power switching circuit including a plurality of high power switches; first means for coupling said high power switches with energization means and a second means for coupling a load to said high power switches; and,

a plurality of isolating means for interfacing said timing and control circuit with said power switching circuit, whereby the output signal of said timing and control circuit determines the application of energy to said load from said energization means.

4,520,282

ELECTRONIC IMPEDANCE CIRCUIT INCLUDING A COMPENSATION ARRANGEMENT FOR D.C. OFFSET

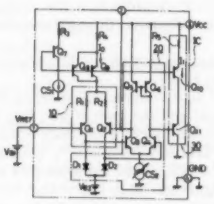
Kazuo Watanabe; Yuichi Ohkubo, both of Takasaki; Akira Haeno, Iruma, and Fumihiko Yokogawa, Tokorozawa, all of Japan, assignors to Hitachi, Ltd. and Pioneer Electronic Corporation, both of Tokyo, Japan

Filed Aug. 27, 1982, Ser. No. 411,997

Claims priority, application Japan, Aug. 28, 1981, 56-134006

Int. Cl.³ H03K *3/023;* **H03H** *11/00*

U.S. Cl. 307—491 **7 Claims**



1. An electronic impedance circuit comprising:

a voltage-current converter which includes a first transistor and a second transistor which have their emitters differentially coupled, wherein a base of said first transistor is biased to a predetermined bias potential;

a first constant current source which is connected to said emitters of said first transistor and said second transistor;

a variable gain current amplifier which includes a third transistor and a fourth transistor which have their emitters differentially coupled, and which amplifier further includes a fifth transistor and a sixth transistor which have their bases connected in common, wherein a base of said third transistor and a base of said fourth transistor are respectively connected to a collector of said first transistor and a collector of said second transistor, wherein said first transistor is connected to a collector of said third transistor as a first load means, wherein said sixth transistor is connected to a collector of said fourth transistor as a second load means, and wherein said collector of said third transistor is connected to a base of said second transistor to feed a collector signal of said third transistor back to said base of said second transistor;

a variable constant current source which is connected to said emitters of said third transistor and said fourth transistor; and

a compensation circuit which is connected to said variable gain current amplifier to compensate a current flowing between said base of said second transistor and said collector of said third transistor, wherein said compensation circuit includes a compensation transistor whose base is connected to said collectors of said fourth and sixth transistors and which further includes a second constant cur-

rent source which is connected in series with the collector-emitter path of said compensation transistor.

4,520,283

BAND PASS FILTER WITH A SWITCHED CAPACITOR

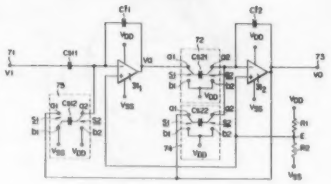
Itsuo Sasaki, c/o Katsunuma, 1315 Kamihirama, Nakahara-ku, Kawasaki-shi, and Hiroaki Suzuki, 2-11-1-514, Kaminagaya, Konan-ku, Yokohama-shi, both of Japan

Filed Jul. 2, 1982, Ser. No. 394,874

Claims priority, application Japan, Sep. 1, 1981, 56-137235; Sep. 1, 1981, 56-137236; Sep. 1, 1981, 56-137237

Int. Cl.³ H03H *11/12;* **H03K** *17/693*

U.S. Cl. 307—520 **6 Claims**



1. A band pass filter comprising:

a signal input terminal to which an input voltage signal is applied;

a signal output terminal from which an output voltage signal is taken out;

first and second power source terminals for connection to first and second power sources, respectively;

first operational amplifier means connected to said first and second power source terminals to be driven by said first and second power sources;

a first feedback capacitor connected between an inverting input terminal of said first amplifier means and an output terminal of said first amplifier means;

an input capacitor connected between said signal input terminal and said inverting terminal of said first amplifier means;

second operational amplifier means connected to said first and second power source terminals to be driven by said first and second power sources, an output terminal of the second amplifier means being connected to said signal output terminal;

a second feedback capacitor connected between an inverting input terminal of said second amplifier means and an output terminal of said second amplifier means;

a first switched capacitor connected, in a first switched mode, between said output terminal of said first amplifier means and said inverting input terminal of said second amplifier means, and, in a second switched mode, short-circuited and connected to said first power source terminal;

feedback circuit means for feeding an output voltage signal of said second amplifier means back to said inverting input terminals of said first and second amplifier means; and

bias means connected to said first and second power source terminals for applying a predetermined bias voltage to non-inverting input terminals of said first and second amplifier means.

4,520,284

ROLLED HOUSING FOR EDDY CURRENT COUPLING

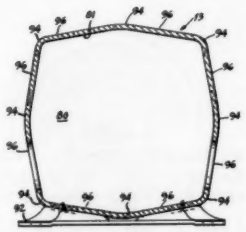
John H. Wolcott, Bristol, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 522,446, Aug. 12, 1983, abandoned. This application May 23, 1984, Ser. No. 612,980

Int. Cl.³ H02K *15/00*

U.S. Cl. 310—42 **22 Claims**

1. An eddy current coupling comprising a housing, a rotor member disposed in said housing, inductor drum means disposed in said housing and rotatable about an axis of rotation relative to said rotor member, and coil means located in said housing for producing an electro-magnetic field for electromagnetically coupling said rotor member and said inductor drum means, said housing including a central portion having a non-circular cross-sectional configuration and first and second end members, said central portion of said housing having an opening at both ends thereof and being expandable in a radial direction perpendicular to said axis of rotation, said central portion of said housing having first, second, third and fourth sides disposed parallel to said axis of rotation, each of said sides including first and second portions disposed parallel to said axis of rotation, said central portion of said housing defining a chamber which is adapted to receive said rotor member, said inductor drum means and said coil means therein, said rotor member and said inductor drum means being spaced apart



from said central portion of said housing said first and second end members including pilot surfaces thereon, one of said first and second end members being adapted to have the pilot surfaces thereon received in one end of said central portion of said housing and the other of said first and second end members being adapted to have the pilot surfaces thereon received in the other end of said central portion of said housing to thereby enclose said chamber in said central portion of said housing and to expand said central portion of said housing in a radial direction to a dimension controlled by the dimension of said pilot surfaces of said first and second end members, said first and second portions of each of said sides of said housing being interconnected by a flexible arcuate portion which allows said first and second portions to flex outwardly upon engagement therewith with said pilot surfaces of said first and second end members.

4,520,285

STARTING MOTOR ASSEMBLY HAVING AN INTEGRAL EPICYCLIC GEAR

Shuzoo Isozumi, and Kazuyoshi Hara, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,750

Claims priority, application Japan, Mar. 1, 1982, 57-29806[U]

Int. Cl.³ H02K *7/116*

U.S. Cl. 310—83 **7 Claims**

1. A starting motor assembly for an internal combustion engine, said starting motor assembly comprising:

(a) a starting motor comprising a yoke surrounding an armature rotary shaft;

(b) an output shaft which is coaxial with said armature rotary shaft; and

(c) an epicyclic reduction gear assembly operatively connected to said starting motor, said epicyclic reduction gear assembly comprising a solar gear mounted on and rotatable with said armature rotary shaft, a planetary gear in engagement with said solar gear and operatively connected to said output shaft such that rotation of said planetary gear about said solar gear causes corresponding rotation of said output shaft, and an internal gear formed integrally in an inner circumferential surface of said yoke

as a part of said yoke, said internal gear being in engagement with said planetary gear,

whereby the rotational speed of said armature rotary shaft is stepped down by said epicyclic reduction gear assembly and said output shaft consequently rotates more slowly than said armature rotary shaft.

4,520,286

APPLIANCE DRIVEN BY AN ELECTRIC MOTOR

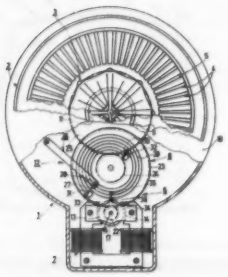
Romuald L. Bukoschek, Klagenfurt, Austria, and Gerhard Diefenbach, Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 16, 1983, Ser. No. 505,018

Claims priority, application Austria, Sep. 7, 1982, 3346/82

Int. Cl.³ H02K *33/10, 7/118, 7/10*

U.S. Cl. 310—83 **3 Claims**



1. An electrically driven appliance such as a citrus press, which comprises a drivable tool; a self-starting single-phase synchronous motor including a diametrically magnetized permanent-magnet rotor forming a rotor field and positioned between two stator poles forming a stator field; a drive mechanism arranged between said motor and said tool for driving the latter, said mechanism including a plurality of drive elements each engaging the adjacent element or elements; and a stalling device coacting with one drive element, said one drive element having a pair of stops and being formed with a groove in a side face thereof, said groove being closed at both ends to provide said stops; said stalling device including a member alternately engageable with said stops after a specific number of revolutions of the rotor in either direction of rotation, such engagement effecting stalling of the rotor and automatic reversal of the direction of rotation of the rotor, said stalling device member comprising an arm pivotally connected at one end to the appliance and having its free end guided in said groove; the physical relationship of said stalling device member and said stops to each other being such that the rotor is stalled in positions wherein the angle between the rotor-field vector intersecting the rotor axis and a line intersecting the rotor axis perpendicularly to the stator field lies within an angular range of 60° in each direction of rotation of the rotor.

4,520,287

STATOR FOR A MULTIPLE-POLE DYNAMOELECTRIC MACHINE AND METHOD OF FABRICATING SAME

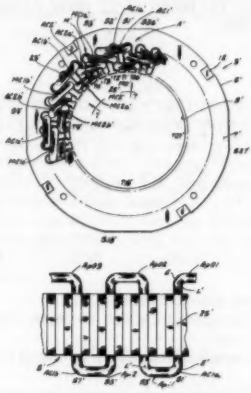
David C. Wang, Fort Wayne, Ind., and Harry W. Voepel, Moscow Mills, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Division of Ser. No. 315,288, Oct. 27, 1981, Pat. No. 4,426,771. This application May 23, 1983, Ser. No. 497,085

Int. Cl.³ H02K *15/06*

U.S. Cl. 310—184 **5 Claims**

1. A stator for a multiple-pole dynamoelectric machine comprising a core of a stack of laminations of suitable ferromagnetic material, said core having a central bore extending therethrough and a plurality of blind slots extending radially outwardly from said bore, said slots being substantially equally angularly spaced about said bore, an auxiliary winding divided into a first auxiliary winding coil set and a second auxiliary winding coil set, and a main winding divided into a first main winding coil set and a second main winding coil set, each of said coil sets being constituted by a respective skein of a suitable magnet wire of petalled, serpentine shape defining a plurality of coils with each coil having a multiplicity of turns of said magnet wire therein and with each coil having a first and a second end turn and a pair of straight coil sections between each of the end turns, said core having a first straight coil section of a first coil of a first of said coil sets inserted in a first



slot of said core and the next straight coil section of said first coil of said first coil set being inserted in the third slot of said core, the remainder of the straight coil sections of said first coil set being inserted in the fifth, seventh, . . . , and next to last slots of said core, said straight coil sections of a second coil set being inserted in said second, fourth, sixth, . . . , and last slots of said core, said straight coil sections of a third coil set being inserted in the third, fifth, seventh, . . . , and first slots of said core, and the coil sections of a fourth coil set being inserted in the fourth, sixth, eighth, . . . , and second slots of said core, said coil sets being electrically connected for operation of said dynamoelectric machine.

4,520,288

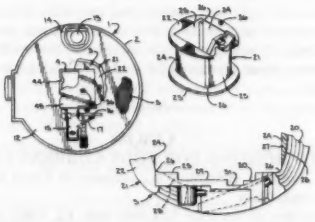
IGNITION MAGNETO HAVING AN IMPROVED PRIMARY WINDING CONSTRUCTION

John D. Santi, West Allis, Wis., assignor to Briggs & Stratton Corp., Wauwatosa, Wis.

Filed Apr. 5, 1984, Ser. No. 596,860

Int. Cl.³ H02K *15/04*

U.S. Cl. 310—194 **10 Claims**



1. A primary winding assembly for an ignition magneto, comprising a bobbin composed of electrically insulating material and having a generally rectangular configuration, said bobbin comprising a pair of end flanges and a pair of opposed

first walls connected to said end flanges and a pair of opposed second walls interconnecting said end flanges, the side edges of each wall being spaced from the side edges of adjacent walls to provide a longitudinally extending slot at each corner of said bobbin, and a wire wound in a plurality of turns around the walls and extending across said slots.

4,520,289

DRIVE CIRCUIT FOR A PIEZO-ELECTRIC ELEMENT

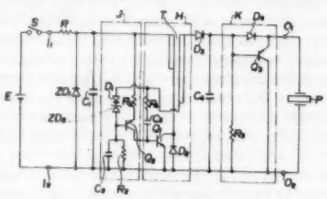
Ryuichi Sato; Tsutomu Taniguchi, both of Kyoto, and Masatoshi Ohba, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 31, 1984, Ser. No. 615,908

Claims priority, application Japan, Jun. 1, 1983, 58-84536[U]

Int. Cl.³ H01L *41/08*

U.S. Cl. 310—316 **8 Claims**



1. For a piezo-electric element:

a drive circuit, comprising:

(a) a blocking oscillator circuit comprising a booster transformer with primary and secondary windings, an oscillation transistor the collector of which is connected to the primary winding of said booster transformer, and a feedback circuit via which a signal at the secondary winding of said booster transformer is fed back to the base of said oscillation transistor so as to produce oscillation;

(b) an electric current control circuit means for restricting electric current from flowing through said oscillation transistor when the voltage at the secondary winding of said booster transformer has become equal to or greater than a certain value;

and

(c) a rectifying element through which said piezo-electric element is connected to the secondary winding of said booster transformer.

4,520,290

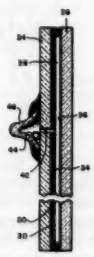
GAS DISCHARGE DISPLAY WITH BUILT-IN HEATER

Jon Cokefair, Waukegan, Ill., assignor to Cherry Electrical Products Corporation, Waukegan, Ill.

Filed Oct. 29, 1982, Ser. No. 437,557

Int. Cl.³ H01J *1/22, 61/60*

U.S. Cl. 313—15 **7 Claims**



1. In a gas discharge display device having a cathode terminal and an anode terminal separated from each other within a sealed gas chamber formed between two layers of glass, the gas in the chamber including a mixture of inert gases and mercury at subatmospheric pressure, the improvement comprising:

heater means on one of said layers of glass positioned proximate the cathode terminal and within the display device for maintaining an internal device temperature of at least 0° C. so that mercury is maintained in a gaseous state within the device; and

insulating means overlying said heater means for electrically insulating said heater means from said cathode and anode terminals to facilitate the conduction of heat from the heater means to the gas in said chamber, and for electrically insulating said heater means from the gas in said chamber so that the heater means does not affect the light discharge between said anode and cathode terminals.

4,520,291

PICK-UP UNIT COMPRISING A CAMERA TUBE

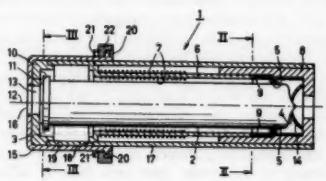
Henricus J. Van Rooy, and Martinus J. Tops, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 312,478, Oct. 19, 1981, abandoned. This application Sep. 26, 1983, Ser. No. 535,550

Claims priority, application Netherlands, Nov. 12, 1980, 8006166

Int. Cl.³ H01J *31/00, 31/26*

U.S. Cl. 313—365 **10 Claims**



1. A pickup unit comprising:

a camera tube having two ends with a window portion at one end and a bottom portion at the other end, said camera tube having contact strips laterally led through the bottom portion of the tube; and

a coil former having an axis and two ends, said coil former surrounding the camera tube, said camera tube being radially centered relative to the ends of the coil former near the window and bottom portions of the tube, said coil former being provided with coils;

characterized in that:

the pickup unit further comprises a sealing cap connected to the end of the coil former at the window portion of the tube, said sealing cap having an abuting face which extends perpendicular to the axis of the coil former and an aperture in the abuting face, said sealing cap comprising means for radially centering the window portion of the camera tube relative to the coil former; and

the coil former further comprises a tube base at the bottom portion of the tube, said tube base comprising:

means for radially centering the bottom portion of the camera tube relative to the coil former;

resilient means for urging the camera tube axially against the abuting face of the sealing cap; and

means for contacting the contact strips of the camera tube.

4,520,292

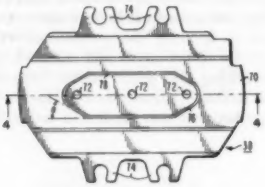
CATHODE-RAY TUBE HAVING AN ASYMMETRIC SLOT FORMED IN A SCREEN GRID ELECTRODE OF AN INLINE ELECTRON GUN

Frans van Hekken, Lancaster, and Hsing-Yeo Chen, Landisville, both of Pa., assignors to RCA Corporation, Princeton, N.J.

Filed May 6, 1983, Ser. No. 492,437

Int. Cl.³ H01J *29/51, 29/54*

U.S. Cl. 313—412 **4 Claims**



1. In a cathode-ray tube comprising an image screen and an inline electron gun for projecting three electron beams along beam paths onto said screen, said gun comprising:

three cathodes for generating said electron beams,

a control grid, a screen grid, and a main electron lens arranged successively in alignment with said cathodes for focusing said electron beams, said control grid and said main electron lens having three apertures disposed in a plane for passing said electron beams, said screen grid having a functional grid area with a given thickness, said screen grid having three apertures formed within said functional grid area and aligned with said apertures in said control grid, the improvement wherein

said screen grid includes a transversely disposed recessed portion having a substantially rectangularly-shaped central part and substantially triangularly-shaped end parts, the apex of each of the triangularly-shaped end parts being smoothly-curved, said recessed portion having said apertures therein, said recessed portion being surrounded by a peripheral rim which conforms to the shape of said recessed portion, the substantially rectangularly-shaped central part of the rim is remote from the central aperture and the triangularly-shaped end parts of the rim are in proximity to the outer apertures thereby affecting the electrostatic field in the vicinity of the outer beam paths by tilting the field lines within said recessed portion causing the electron beams passing through the outer apertures to converge toward the center electron beam.

4,520,293

HIGH FREQUENCY AMPLIFIER

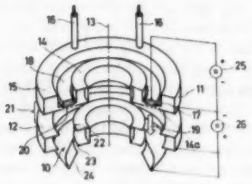
Klaus-Rainer Müller, Mannheim-Vogelstang, Fed. Rep. of Germany, assignor to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,639

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1982, 3204833

Int. Cl.³ H01J *25/22*

U.S. Cl. 315—5.25 **10 Claims**



1. A high frequency amplifier for a frequency range from 300 MHz to 3 GHz and having an output power in the megawatt range, said amplifier having an axial axis and comprising:

(a) means for generating a rotating electron beam including

(1) a ring shaped input resonator which is rotationally symmetric with respect to the amplifier axis, said input resonator being formed to present an input gap concentric to the amplifier axis,

(2) means for generating a high frequency electrical field in said input resonator, and

(3) a cathode ring disposed in front of said input gap for generating the rotating electron beam in response to the high frequency electrical field;

(b) a ring shaped output resonator constructed for passage therethrough of the beam and for converting the kinetic energy of the electrons in the beam into high frequency power, said output resonator being rotationally symmetric with respect to the amplifier axis, axially spaced from said input resonator and electrically biased by a direct voltage potential difference with respect to said input resonator, wherein the axial space between said input resonator and said output resonator constitutes a direct voltage acceleration path for the electrons emitted from said beam generating means, the electron beam traverses the acceleration path within an annular cylindrical region coaxial with the amplifier axis, the electrons of the beam enter said output resonator with substantially identical velocities, and the kinetic energy of the electrons is converted in said output resonator to high frequency power in dependence on the azimuthal angle width of said beam;

(c) a grid ring disposed at the side of said input resonator between said cathode ring and said output resonator, the electron beam exiting said beam generating means through said grid ring and said grid ring restricting the passage of an electrical field from into said input resonator; and

(d) a collector disposed on the side of said output resonator remote from said input resonator;

(e) wherein said beam generating means, said acceleration path, said output resonator and said collector are axially disposed one behind the other in the direction of the amplifier axis.

4,520,294

HIGH PRESSURE METAL VAPOR DISCHARGE LAMP

Takenobu Iida, Urawa, and Shunichi Sasaki, Tokyo, both of Japan, assignors to Iwasaki Electric Co., Ltd., Tokyo, Japan

Filed Aug. 11, 1983, Ser. No. 522,344

Claims priority, application Japan, Aug. 23, 1982, 57-144795

Int. Cl.³ H01J *7/44*

U.S. Cl. 315—50 **28 Claims**

1. A high pressure metal vapor discharge lamp comprising:

a starting circuit connected in parallel with a light emitting tube having at least one pair of main electrodes;

said starting circuit including a serial circuit of at least;

(i) a thermo-sensitive switch which is closed at a room temperature and opened at a high temperature,

(ii) a voltage-sensitive semiconductor switching device surrounded by a glass material, and

(iii) a ceramic capacitor surrounded by a glass material

and exhibiting a non-linear voltage charge characteristic,

said starting circuit and said light emitting tube being accommodated in an outer bulb having an appropriate amount of inert gas filled therein or essentially evacuated; and

said starting circuit being connected to an AC power supply through an inductive stabilizer.

4,520,295

STEP-WISE DIMMER CONTROL CIRCUIT FOR A DISCHARGE LAMP

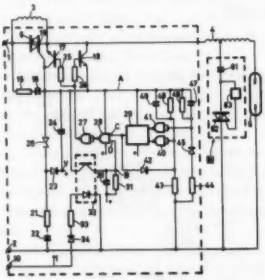
Pieter J. Bolhuis, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 25, 1982, Ser. No. 436,538

Claims priority, application Netherlands, Nov. 9, 1981, 8105046

Int. Cl.³ H05B *37/02, 41/38*

U.S. Cl. 315—291 **10 Claims**



1. An electric arrangement for step-wise controlling the luminance of a discharge lamp comprising, two input terminals adapted to be connected to an a.c. voltage source, means connecting a series arrangement of the lamp and at least two electric coils across said input terminals, a first controlled semiconductor switching element having a thyristor characteristic connected in parallel with one of said coils, a control circuit coupled to the semiconductor switching element so as to make the semiconductor switching element conductive after a periodic zero-crossing of the current through the lamp in the least dimmed state of the lamp, and an auxiliary arrangement coupled to the control circuit so as to inhibit the operation thereof by means of which the semiconductor switching element is made conductive, the control circuit of the semiconductor switching element comprising a connection from a control electrode to a main electrode of the semiconductor switching element that is free of a voltage-increasing circuit element, the inductance of said one coil having a value such that on reignition of the lamp after said zero crossing of the current, the one coil produces a voltage on the control electrode of the semiconductor switching element sufficient to make said switching element conductive.

4,520,296

ELECTRIC MOTOR DRIVE ARRANGEMENT

Eberhard Lepper, and Karl-Heinz Lust, both of Lahnau, Fed. Rep. of Germany, assignors to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH, Asslar, Fed. Rep. of Germany

Filed Mar. 21, 1983, Ser. No. 477,224

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1982, 3210352

Int. Cl.³ H02P *5/06;* **H02K** *37/00*

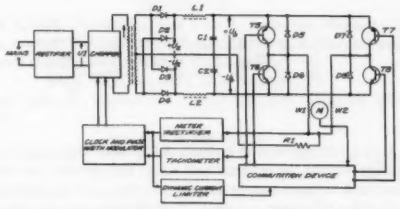
U.S. Cl. 318—254 **7 Claims**

1. An electric drive arrangement for a motor with two phase windings connected to a common connection point comprising:

a motor supply having a chopper circuit and a voltage source having a neutral point,

a pulse width modulator for producing control pulses, said pulse width modulator being connected to said chopper circuit and to the common connection point of the two phase windings,

a current measuring resistor connecting said common connection point to said neutral point of the voltage source for forming voltage drop proportional to the current through said motor and influencing the width of said control pulses of said pulse width modulator,



said pulse width modulator being connected to said resistor to vary the widths of the pulses on the basis of the voltage drop across the resistor, said chopper being connected to said pulse width modulator so that said pulse width modulator controls the chopping time on the basis of the voltage drop across the resistor and said chopper being connected to said voltage source to vary the voltage of the voltage source in a direction to keep the current through the resistor constant.

4,520,297

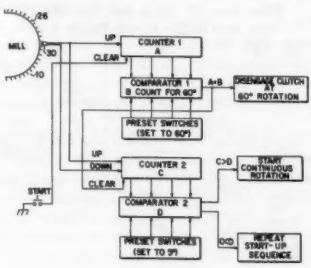
SOLIDIFIED CHARGE PROTECTION CONTROL FOR ROTATING APPARATUS

John S. League, IV, Baltimore, Md., assignor to Mineral Processing Systems, Inc., York, Pa.

Filed Sep. 3, 1982, Ser. No. 414,632

Int. Cl.³ F27B *7/00*

U.S. Cl. 318—490 **4 Claims**



1. An electrical control apparatus for determining if a charge has solidified in a rotating apparatus comprising:

(a) means for sensing the angular position of the rotating apparatus;

(b) means for sensing an initial rest position of the rotating apparatus;

(c) means for rotating said apparatus a pre-set amount;

(d) means to cause said apparatus to oscillate in a free manner;

(e) means to evaluate the oscillation and sense a final rest position of said apparatus; and

(f) means to restart the rotation of said apparatus if said final

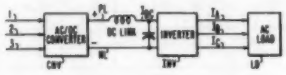
rest position is moved from said initial rest position by more than a pre-set angular amount.

4,520,298

METHOD AND APPARATUS FOR SAMPLING OUTPUT AC CURRENTS IN A VOLTAGE-FED INVERTER POWER SUPPLY

Alberto Abbondanti, Penn Hills, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 3, 1984, Ser. No. 596,332
Int. Cl.³ G01R *19/00*; H02P *5/40*
U.S. Cl. 318—490 **23 Claims**



1. In a voltage-source inverter AC power supply including a voltage-source, an inverter and a DC link passing DC current from said voltage-source to said inverter, said inverter having a plurality of power switches controlled in accordance with a modulation pattern for outputting AC currents on polyphase AC lines, the method of deriving a signal representative of at least one of said AC currents comprising the steps of:

deriving from said DC link sample representative of said DC current during successive sampling instants;

deriving a logic representation of the actual switching status of said power switches between an ON and an OFF status in accordance with said pattern for each said sampling instant;

correlating a succession of said DC current samples with a corresponding one of said AC currents in accordance with said actual switching status logic representation; and

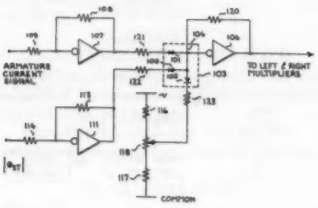
deriving said representative signal in relation to said succession of DC current samples.

4,520,299

TURNING SPEED CONTROLLER FOR ELECTRIC VEHICLES HAVING DUAL DRIVE MOTORS

Charles E. Konrad, Roanoke, Va., assignor to General Electric Company, Charlottesville, Va.

Filed Dec. 22, 1983, Ser. No. 564,573
Int. Cl.³ B62D *11/04*; H02P *7/68*
U.S. Cl. 318—587 **5 Claims**



1. In a control system for an electrically powered vehicle of the type having dual drive motors with series connected armature windings and separately excited field windings, said dual motors being arranged such that one motor thereof is provided for each of two driven wheels on a common axle line, apparatus for automatically limiting the vehicle speed as a function of its turning angle during a turning maneuver, comprising:

field regulating means for regulating the excitation of said field windings in accordance with a field regulating signal;

means providing a first signal representative of the current flowing in said armature windings;

means providing a turning angle signal having a value which is a function of the selected turning angle for said vehicle;

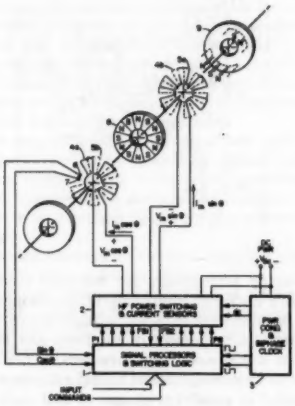
a field excitation selector having first and second inputs receiving said first signal and said turning cycle signal thereat, respectively, said selector being operative to select as said field regulating signal said first signal or said turning angle signal, depending on which one of said signals provides the greatest field excitation, whereby said field excitation is increased with sharper turning angles and said vehicle is thereby automatically operated at a reduced speed.

4,520,300

BRUSHLESS ULTRA-EFFICIENT REGENERATIVE SERVOMECHANISM

Richard B. Fradella, 33872 Calle Conejo, San Juan Capistrano, Calif. 92675

Filed Dec. 6, 1982, Ser. No. 433,170
Int. Cl.³ H02P *3/18*
U.S. Cl. 318—603 **27 Claims**



1. Cooperative with a polyphase synchronous motor in a servomechanism for providing regenerative motion control, a switching controller, responsive to various input commands and to polyphase transducer signals that vary sinusoidally with rotor angle and correspond to respective stator phases, for synchronously controlling polyphase stator current; including in combination:

means for deriving, from the transducer signals, the instantaneous magnitudes, polarities, and frequency thereof;

signal interface means, responsive to various input command signals, and variously, to the instantaneous magnitudes, polarities, and frequency, for providing a torque amplitude signal, and variously, binary forward drive, reverse drive, and brake commands;

multiplier means, responsive to the instantaneous magnitudes and to the torque amplitude signal, for providing respective synchronized amplitude control signals;

a high-frequency power switching circuit, having power switching transistors which are selectively switched at a variable duty-cycle, for effecting controlled alternating stator currents;

current sensors, having current transformers with primary windings in series with respective power switching transistors, for providing inductively coupled current feedback pulses proportional to instantaneous current thru the respective transistors;

oscillator means, that provide a high-frequency squarewave signal;

pulse control means, for initiating, from the squarewave

signal, staggered pulses each having a restricted duty-cycle, and each having a variable duration dictated by the respective synchronized amplitude control signal and the corresponding current feedback pulse;

switching logic, responsive to the staggered pulses, to said polarities, and to the binary commands, for controlling the selection and duty-cycle of said transistors;

means for sourcing and sinking dc power and high-frequency current.

24. Cooperative with a switching controller in a servomechanism for providing regenerative motion control, a polyphase synchronous motor, which provides polyphase transducer signals that each vary sinusoidally with rotor angle in synchronism with the emf of a corresponding stator winding, for producing bidirectional torque proportional to synchronously controlled polyphase stator current and polyphase emf proportional to rotor speed; including in combination:

two permanent-magnet rotor end-disks, each providing at one face a pattern of evenly distributed alternating poles from merged looping tangential magnetized paths therein;

permanent-magnet rotor disks, each providing at both faces a like number of evenly distributed alternating poles from axially magnetized paths therethru;

rotatable means for holding a coaxial stack of the rotor disks and end-disks, each affixed to every other with axial spaces therebetween having an aligned axial magnetic field pattern that rotates therewith;

a stator ring, containing polyphase stator windings, and corresponding polyphase transducers which each provide a sinusoidal signal that varies with the axial magnetic field thereat, cemented together in a molded non-ferromagnetic matrix;

stator rings, each containing polyphase stator windings cemented together in a molded non-ferromagnetic matrix;

means for holding a coaxial stack of the stator rings, each fixed to a motor mount, such that corresponding phases are in alignment, and the stator windings and transducers juxtaposed to the rotor disks and end-disks in respective alternation therewith in the axial spaces therebetween.

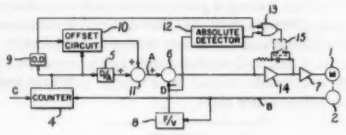
4,520,301
CONTROLLING APPARATUS FOR POSITIONING

Hayao Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan

Filed Jun. 16, 1983, Ser. No. 505,057

Int. Cl.³ G05B *11/36*

U.S. Cl. 318—609 **7 Claims**



1. A positioning control apparatus for controlling a positioning device of the type having a motor, a digital type position detector, a speed detector and a feedback control device and which operates in response to input pulses in accordance with the speed and the number of the pulses; said apparatus comprising:

a first means for comparing the pulse number of the input pulses with that of the feedback pulses from said digital type position detector;

a second means for converting the output signal from said first means into an analog form;

a third means for subtracting the signal from said speed detector from the output signal from said second means;

a fourth means for detecting the absolute value of the signal of said speed detector to obtain a corresponding binary code thereof;

a PI amplifier for amplifying the output signal from said third means; and

a switching means for changing said PI amplifier so as to act as a P amplifier, the switching means having an input terminal connected to said fourth means and an output terminal connected to said PI amplifier, said switching means being rendered operative to effect the changing of the PI amplifier when the detected result of said fourth means shows that the speed is larger than a given value.

4,520,302
STEPPING MOTORS AND DRIVE CIRCUITS THEREFOR

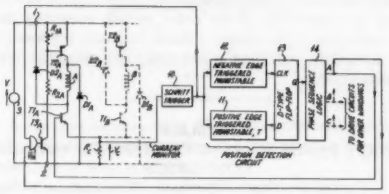
Roland J. Hill, Cambridge, and Paul P. Acarnley, Weston Colville, both of England, assignors to National Research Development Corporation, London, England

Filed Mar. 12, 1984, Ser. No. 588,225

Claims priority, application United Kingdom, Mar. 15, 1983, 8307047

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **6 Claims**



1. A drive circuit for a stepping motor having at least one stator phase winding comprising:

phase switching means associated with said at least one phase winding for switchably connecting said at least one phase winding to supply terminals;

phase control means for operating the phase switching means;

means for repeatedly chopping the electrical connection from the supply terminals to said at least one phase winding when current flow in such phase winding has risen to a predetermined value;

a by-pass circuit associated with each of said at least one phase winding for allowing current flow through the winding to decay when the chopping means operates;

means for restoring the electrical connection from the supply terminals to said at least one phase winding after a delay time;

means for measuring a characteristic of current flow in the motor to derive an indication of rotor position, said characteristic being selected from the group of characteristics comprising current rise time, current decay time and chopping frequency; and

means for utilizing the value of the characteristic measured in said measuring means to operate the phase control means.

4,520,303
INDUCTION MOTORS

Philip A. Ward, Staffordshire, England, assignor to Associated Electrical Industries Limited, England

Filed Feb. 15, 1984, Ser. No. 580,558

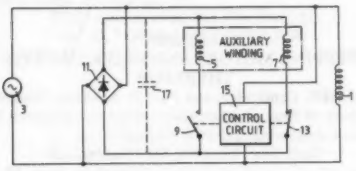
Claims priority, application United Kingdom, Feb. 21, 1983, 8304714

Int. Cl.³ H02P *1/42*

U.S. Cl. 318—778 **5 Claims**

1. A single phase induction motor comprising: a first winding arranged for energization from a single phase supply; an electronic switching arrangement; a second winding arranged

for energization from said supply via said electronic switching arrangement; and control means arranged to control the operation of said switching arrangement in synchronism with the supply so that the phases of the voltages across said first and second windings differ by an amount sufficient to provide a starting torque, and wherein said second winding comprises two portions, said switching arrangement comprises two



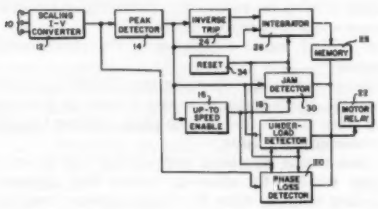
switches each connected in series with a respective one of said second winding portions across said supply and said control means is responsive to the supply to render said switches conducting alternately with a changeover from conduction of one switch to conduction of the other switch occurring during each half cycle of the supply voltage, said two portions of the second winding providing, when energized, magnetic fields of opposite sense.

4,520,304

THREE PHASE SCALING CURRENT-TO-VOLTAGE CONVERTOR

Earl J. Curran, Jr., South Milwaukee, Wis., assignor to Square D Company, Palatine, Ill.

Filed Sep. 30, 1982, Ser. No. 431,920
Int. Cl.³ H02P *5/00*
U.S. Cl. 318—800 **1 Claim**



1. In an induction motor controller for a three-phase motor, the controller including means responsive to a voltage control signal for disconnecting power for a motor being controlled, a converter for producing the voltage control signal comprising:

a plurality of current transformers (**56**, **58**, and **60**), one of each of the plurality connected to monitor current in one phase of the motor being controlled;

a plurality of diodes (**62**, **64**, and **66**) one of each of the diodes connected across one of each of the current transformers and one of each of the diodes connected to one of each of the current transformers to constitute with the others a half-wave rectifier;

a capacitor (**68**) connected to each of the rectifying diodes and to each of the current transformers to comprise with the diodes a peak current detector;

an operational amplifier (**70**) connected to the capacitor and receiving from it a voltage that is proportional to the rectified current that is detected by the current transformers;

a plurality of resistors (**72**), selected individually by a switch (**74**) so that one of the resistors is selectable to adjust gain of operational amplifier (**70**); and

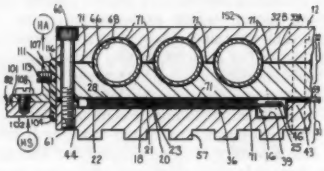
a drive transistor (**76**) connected to receive as an input the output of operational amplifier (**70**) and connected to produce as an output the voltage control signal.

4,520,305

THERMOELECTRIC GENERATING SYSTEM

Charles J. Cauchy, 935 Lincoln St., Traverse City, Mich. 49684

Filed Aug. 17, 1983, Ser. No. 524,041
Int. Cl.³ H02N *0/00*
U.S. Cl. 322—2 R **21 Claims**



1. A thermoelectric electricity generating system for connection with a heat source and a heat acceptor comprising a source of fluid at a temperature less than that of the heat source, said system comprising:

first and second elongate plates of substantially constant cross section and of high heat and electrical conductivity metal, said first and second plates being releasably connected in facing relation with opposing inner surfaces, at least one said opposing inner surface being formed with an elongate recess extending lengthwise of the corresponding said plate;

a plurality of flat, platelike thermoelectric members disposed edge by edge along said recess and snugly sandwiched between said first and second plates, said thermoelectric members each comprising a plurality of heatable junctions on one side facing said first plate and a plurality of coolable junctions on the other side facing said second plate;

a surface layer which is very thin compared to the thickness of said plates and has a conductivity relatively high as to heat and relatively low as to electricity, said surface layer establishing wide area contact of said heatable and coolable junctions with the opposed first and second plates, respectively, so as to transfer heat from said first plate to one side of said thermoelectric member and from the other side of said thermoelectric member to said second plate without electrically shorting adjacent junctions on either side of said thermoelectric member, each said thermoelectric member having a pair of electrical output terminals, the output terminals of said thermoelectric members being aligned along said recess and connected to electric output lines, said first and second plates being respectively thermally coupleable to said heat source and said source of lower temperature fluid.

4,520,306

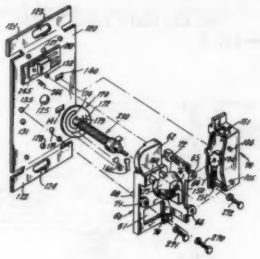
WALL MOUNTED ELECTRICAL VOLTAGE CONTROL SWITCH

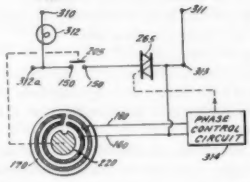
David Kirby, Emmaus, Pa., assignor to Lutron Electronics Co., Inc., Coopersburg, Pa.

Filed Aug. 22, 1983, Ser. No. 525,129
Int. Cl.³ H05B *39/04*
U.S. Cl. 323—324 **23 Claims**

1. A voltage control switch capable of being mounted in a wall box comprising, in combination; a molded plastic switch housing containing the first and second cooperable contacts of an air gap switch; a molded plastic potentiometer housing containing a rotatable and axially movable operating shaft and a variable resistor structure coupled to said shaft, whereby the resistance of said variable resistor structure is varied in response to the rotation of said shaft; a conductive generally flat yoke; power semiconductor means connected in thermal ex-

change relation relative to said yoke; said power semiconductor means having leads extending therefrom connected in series with said air gap switch to define the main terminals of said voltage control switch; said variable resistor structure being electrically coupled to said power semiconductor means to vary the conduction time of said power semiconductor means in response to rotation of said shaft; said shaft being





mechanically coupled to said air gap switch to change the condition of said switch between an open and closed position each time said shaft is moved in a given axial direction; and connection means connecting said potentiometer housing and said switch housing to one side of said yoke with said shaft extending through an opening in said yoke and being accessible for operation from the side of said yoke opposite to said one side.

4,520,307

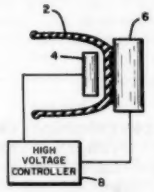
HIGH-VOLTAGE TIRE TESTING APPARATUS

Arnold A. Weiss, 1225 LaSalle, #1008, Minneapolis, Minn. 55403, and Dale A. Gustafson, Minneapolis, Minn., assignors to Arnold A. Weiss, Minneapolis, Minn.

Continuation of Ser. No. 368,357, Apr. 14, 1982, abandoned. This application Mar. 8, 1984, Ser. No. 587,670

Int. Cl.³ G01R *31/12*

U.S. Cl. 324—54 **23 Claims**



23. Non-destructive, flaw detecting apparatus comprising:

a first head mounted inside the carcass of a metal containing tire under test;

means for moving said tire under test relative to said first head and/or said first head relative to said tire;

means coupled to said first head for establishing a voltage potential and a high electric field thereat whereby an arc is produced between said first head and said metal upon the presence of a flaw in said test tire in the vicinity of said first head.

4,520,308

PROCESS AND DEVICE FOR THE NONDESTRUCTIVE MEASUREMENT OF MATERIAL ACCUMULATIONS OR COATING THICKNESSES ON DIELECTRIC MATERIALS, IN PARTICULAR PLASTIC

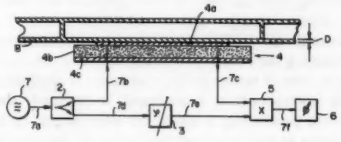
Thomas Rohde, Meinerzhagen, and Friedhelm Caspers, Bochum, both of Fed. Rep. of Germany, assignors to Elektro Physik Hans Nix & Dr. Erich Steingroever, Cologne, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,384

Claims priority, application Fed. Rep. of Germany, Sep. 5, 1981, 3135263

Int. Cl.³ G01R *27/04*

U.S. Cl. 324—58.5 R **15 Claims**



10. Apparatus for measuring thickness or material accumulation of a sheet of dielectric material such as plastic, comprising:

a microwave strip line; and

means to determine the change in propagation time of a signal supplied to said strip line as a function of said characteristic being measured.

4,520,309

SYSTEM FOR TESTING THE MALFUNCTIONING OR CORRECT OPERATION OF A CIRCUIT WITH LOGIC COMPONENTS

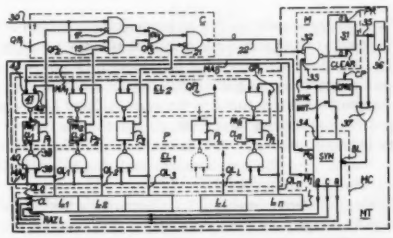
André Laviron, Fontaine les Dijon, and Claude Berard, Is-sur-Tille, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Mar. 5, 1982, Ser. No. 355,094

Claims priority, application France, Mar. 11, 1981, 81 04868

Int. Cl.³ G01R *31/28*

U.S. Cl. 324—73 R **1 Claim**



1. A system for testing the operation of a circuit having n components and an output, said system comprising:

storage means having a first input connected to the output of said circuit, a second input and an output;

a set of at least n flip flops, each having an output and at least one input, each of said ouputs being connected as an input to a corresponding one of said n components;

a logic assembly for selection and control of the flip-flops having at least n segments each of said segments corresponding to one of said n flip flops, each of said segments

having an output connected to the input of the corresponding flip flop, a first input and two control inputs;

a shift register containing at least n stages connected in series, each of said stages corresponding to one of said flip flops and one of said segments and having an output connected to the first input of the corresponding segment, said shift register having a return to zero input, a signal input and a shift input; a logic synchronization means having first and second outputs connected to said two control inputs of each segment of said logic assembly, third, fourth and fifth outputs connected to said return to zero input, said signal input and said shift input of first stage of said shift register, a sixth output connected to the second input of said storage means and an input connected to the output of said storage means;

wherein a signal to said input to said component causes said component to malfunction and

wherein said synchronization means produces a logic pattern within said shift register through said signal input, causing selected ones of said segments and said flip flops to receive an input signal, and selected ones of said components to malfunction, said synchronization means changing the output of one segment at a time through said two control inputs so that the state of malfunctioning of the corresponding component is changed, the storage means producing a signal on said output to indicate a change in the output of the circuit in response thereto.

4,520,310

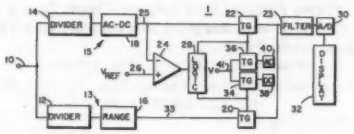
AUTOFUNCTION VOLTMETER

Austin T. Kelly, Morris Plains; Alan H. Stolpen, Union, and Philip Emile, Jr., Roseland, all of N.J., assignors to Sycon Corporation, Marion, Ohio

Filed Jun. 18, 1982, Ser. No. 389,723

Int. Cl.³ G01R *15/08, 17/02*

U.S. Cl. 324—115 **15 Claims**



1. In a measuring device for an input voltage, which device has an input voltage means for receiving the input voltage, an AC to DC converter means for providing a DC output voltage, and a measurement and display means; a circuit structure for changing operating function between AC and DC measuring and display modes, which circuit structure is operatively connected with the input voltage means, the AC to DC converter means, and the measurement and display means, the circuit structure comprising:

comparing means connected for comparing a portion of the input voltage with a first reference voltage and for providing an output signal having states indicative of the result of the comparison,

controlled switching means responsive to the output signal of said comparing means for connecting and disconnecting the output voltage of the AC to DC converter means to and from, while at substantially the same time disconnecting and connecting the input voltage from and to, the measurement and display means,

whereby input voltages are automatically measured and displayed as AC voltages with AC to DC conversion whenever the input voltages have an AC component of a particular relation to the first reference voltage.

4,520,311

CURRENT TO PULSE-SEQUENCE TRANSDUCER

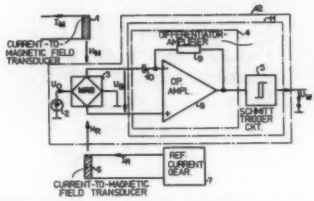
Jan Petr, Oberwil, and Benedikt Steinle, Zug, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed May 4, 1982, Ser. No. 374,797

Claims priority, application Switzerland, May 19, 1981, 3259/81

Int. Cl.³ G01R *19/00, 19/26*

U.S. Cl. 324—117 R **8 Claims**



1. A current to pulse-sequence transducer for transforming an alternating current to be measured into a sequence of pulses having a certain mark-to-space ratio,

comprising in combination,

transforming means for transforming the current to be measured into a measurement magnetic field having a strength substantially linearly proportional to the current to be measured,

means for generating an alternating reference magnetic field magnetically coupled to said transforming means, said alternating reference magnetic field having a frequency considerably higher than that of said alternating current, and

magnetic field comparison means, including

magnetoresistive thin film means magnetically coupled to said transforming means, and normally providing a zero output when said fields are equal, but generating an impulse at a moment in time when the strength of one magnetic field exceeds the strength of the other magnetic field, and

impulse processing means, including

a differentiator amplifier connected to the output of said magnetoresistive thin film means, and

a Schmitt trigger circuit, changing its state upon receiving an input having at least a predetermined threshold value, and postcoupled to said differentiator amplifier,

whereby there will be generated said sequence of pulses having said mark-to-space ratio in dependence of said alternating current to be measured, and there will be minimized the influence of any external electromagnetic disturbance picked up by said transducer having a magnitude below said threshold value on reaching said Schmitt trigger circuit.

4,520,312

METHOD FOR DETERMINING THE INTEGRITY OF PASSIVANT COVERAGE OVER RECTIFYING JUNCTIONS IN SEMICONDUCTOR DEVICES

Ming L. Tarng, San Diego, Calif., and William S. Romito, Somerset, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Nov. 3, 1982, Ser. No. 438,931

Int. Cl.³ G01R *31/21, 31/02*

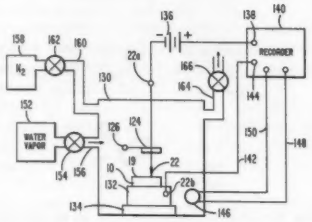
U.S. Cl. 324—158 D **8 Claims**

1. A method for determining the integrity of passivant coverage over a rectifying junction in a semiconductor device as manifested by humidity-induced leakage current, said device having passed a test of operability prior to passivation, comprising the steps of:

passivating the junction of said device with at least one layer of passivant material,

providing a reverse bias voltage at a predetermined value across said junction,

exposing the passivated device initially to a dry environment of substantially zero percent humidity while determining in said dry environment the reverse biased current flow through said device at said zero percent humidity,



thereafter exposing the device to a humid environment of predetermined relative humidity while determining in said humid environment the reverse biased current flow through said device and said junction; and

comparing the value of the respective currents to determine the integrity of the passivant, a defective passivant being manifested by a larger reverse biased current flow for said humid environment than the reverse biased current flow for said dry environment.

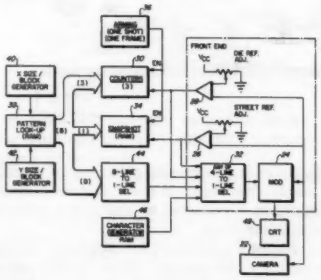
4,520,313
SEMICONDUCTOR TESTING AND APPARATUS THEREFOR

Laurence L. Allred, Jr., and Bradley N. Lange, both of Chandler, Ariz., assignors to Advanced Semiconductor Materials America, Inc., Phoenix, Ariz.

Filed Mar. 30, 1982, Ser. No. 363,641

Int. Cl.³ G01R *31/00*

U.S. Cl. 324—158 R **9 Claims**



1. A method of locating and testing a semiconductor die surrounded by a border region comprising:

scanning preselected regions of said die and said border region to generate a video signal corresponding thereto;

digitizing said video signal such that a light region of said die represented by a first potential and a dark region of said die is represented by a second potential;

storing said digitized video signal of said preselected regions; and

comparing said stored digitized video signal with a stored digitized video signal which corresponds to an acceptable semiconductor die.

4,520,314
PROBE HEAD ARRANGEMENT FOR CONDUCTOR LINE TESTING WITH AT LEAST ONE PROBE HEAD COMPRISING A PLURALITY OF RESILIENT CONTACTS

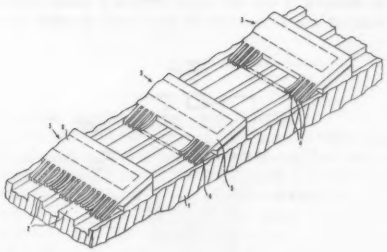
Karl Asch, Guelstein; Johann Greschner, Pliezhausen; Michael Kallmeyer, and Werner Kulcke, both of Boeblingen, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 8, 1982, Ser. No. 433,341

Claims priority, application European Pat. Off., Oct. 30, 1981, 81109373.1

Int. Cl.³ G01R *1/06, 31/02*

U.S. Cl. 324—158 P **11 Claims**



6. In a test apparatus for contacting and testing a plurality of exposed closely spaced electrically conductive members of very small dimensions, the subcombination of a probe head adapted to provide electrical contact with said electrical conductive members, comprising

a monolithic monocrystalline silicon comb-shaped structure having a spine portion and plurality of elongated teeth depending therefrom to provide a plurality of miniature resilient cantilever beams,

the said teeth having been selectively processed so as to have a substantially lower resistance than similarly configured teeth of pure silicon, and

individual electrical connections to each of said teeth for performing electrical testing of any of the electrical conducting members contacted by the said teeth when the probe head is deployed in physical contact with the electrical conductor assembly.

4,520,315
NUCLEAR SPIN TOMOGRAPHY METHOD

Wilfried Loeffler, Herzogenaurach; Arnulf Oppelt, Buckenhof, and Horst Siebold, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 1, 1982, Ser. No. 413,962

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1981, 3135335

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **18 Claims**

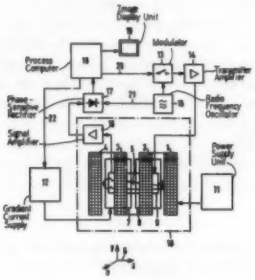
1. A nuclear spin tomography method comprising effecting a mensuration of all two-dimensional Fourier components of a desired nuclear spin density in a selected layer with the use of three gradient fields disposed in three mutually orthogonal directions x, y, z, and effecting an image reconstruction with respect to the desired nuclear spin property in said layer, characterized in that, employing an optimally brief pulse train, said mensuration is effected by the steps comprising:

(1) applying in conjunction with a first field gradient G_z with respect to a first axis z a shaped 90° high frequency pulse 90°-Hf-P to excite a layer with a given location with respect to the first axis z=const for a 90° pulse time duration T_p,

(2) following termination of the 90° high frequency pulse of

said 90° pulse time duration T_z, applying orthogonally related second and third field gradients G_x and G_y with respect to second and third axes x and y, the second field gradient G_x having a timing $T_{x/2}$ and T_x related to the scanning of the layer relative to said second axis, and the third field gradient G_y having a variable timing characteristic to provide a variable gradient effect in successive measurement cycles so as to provide for scanning of different regions of the excited layer in successive measurement cycles,

(3) applying at a constant time $t_{\pi 1}$ after the 90° high frequency pulse a 180° high frequency pulse 180°-Hf-P and subjecting the layer to a field gradient G_z with respect to said first axis z for a time interval $T_{z/2}$ where T_z after the application of the 180° high frequency pulse which time interval is less than said 90° pulse time duration T_z, and



(4) with the presence of a field gradient with respect to said second axis G_x during a further time duration T_x, measuring the resulting nuclear spin echo having a symmetry center at a fixed time t_{E1};

said mensuration being effected by repeating steps one through four above to effect successive measurement cycles, and by varying the timing of the third field gradient G_y in relation to the constant time $t_{\pi 1}$ in successive measurement cycles so as to vary the difference between the third field gradient effect $\int G_y(t)\,dt$ before and after said 180° high frequency pulse in increments of a size $T_x G_x \cdot 1/N$ proportionate to the product of the second field gradient G_x, the further time duration T_x and the reciprocal 1/N of the number of said measurement cycles.

4,520,316

NMR IMAGING TECHNIQUE

Laurance D. Hall, and Subramaniam Sukumar, both of Vancouver, Canada, assignors to The University of British Columbia, Vancouver, Canada

Filed Apr. 25, 1983, Ser. No. 488,415

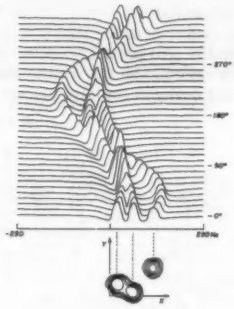
Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **27 Claims**

1. A method of obtaining an NMR spectrum for at least a portion of a specimen slice, comprising:

(a) acquiring n projections of the specimen slice, where $n >> 1$;

(b) shifting the projections Δf for a point in the specimen slice; and



(c) summing the shifted projections so as to produce a point spectrum for the point.

4,520,317

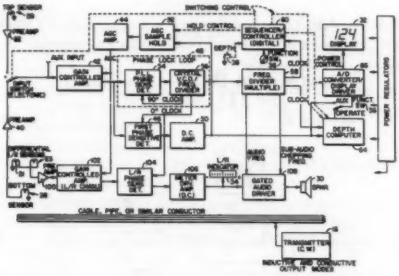
APPARATUS INCLUDING A PAIR OF AUTOMATIC GAIN CONTROLLED AMPLIFIERS FOR DETERMINING THE LATERAL DIRECTION TO A CONCEALED CONDUCTIVE OBJECT

Earl J. Peterman, Philo, Calif., assignor to Metrotech, Inc., Mountain View, Calif.

Division of Ser. No. 174,185, Jul. 31, 1980, Pat. No. 4,387,340. This application Jun. 3, 1983, Ser. No. 500,634

Int. Cl.³ G01V *3/11, 3/165*

U.S. Cl. 324—326 **7 Claims**



1. An apparatus for determining the lateral direction to a concealed conductive object in order to determine its depth, wherein the object is radiating an alternating current signal, said apparatus comprising:

first signal receptor coil means for receiving said signal and for providing a first output voltage in proportion to the strength of said signal received, said first coil means having a first axis;

second signal receptor coil means for receiving said signal and for providing a second output voltage in proportion to the strength of said signal received, said second coil means having a second axis;

support means for positioning said first and second signal receptors a selected and fixed horizontal distance apart and with said first axis and said second axis coaxially aligned;

signal combining means for combining said first output voltage and said second output voltage in a subtractive mode to produce a combined output voltage;

third signal receptor positioned along a line which is substantially perpendicular to and which bisects a line defined

by the first and second coil means; said third signal receptor for receiving said signal and for providing a third output voltage in proportion to the strength of said signal received and having a reference phase;

first amplifier means with an input, an output and a gain for receiving said third output voltage at the input and for providing an amplified third output voltage at the output;

second amplifier means with an input, an output and a gain for receiving said combined output voltage at the input and for providing an amplified combined output voltage at the output;

automatic gain control means responsive to said third output voltage for automatically controlling the gain of said first and second amplifier means such that the gain of said first and second amplifier means is the same;

phase detecting means responsive to said amplified combined output voltage and to said amplified third output voltage for converting said amplified combined output voltage to a direct current voltage with polarity determined by said reference phase; and

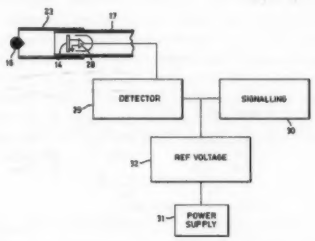
indicating means responsive to said direct current voltage for indicating direction to said object.

4,520,318

ELECTRIC FIELD STRENGTH INDICATOR

Marcel Hascal, 183 Robert Hicks Dr., Willowdale, Ontario, Canada M4R 3R3; Donald A. Watson, R.R. #1, Claremont, Ontario, Canada L0H 1E0; Andrew Danielski, 180 Sherwood Ave., Oshawa, Ontario, Canada L1G 3L8, and Sergio Lopez, 580 Mary St. East, Apt. #113, Whitby, Ontario, Canada L1N 2R3

Filed Feb. 17, 1983, Ser. No. 467,257
Int. Cl.³ G01R *29/12*
U.S. Cl. 324—457 **12 Claims**



1. An electric field strength indicating device for use in association with high voltage conductors, comprising:

an elongate probe carrier,

a probe electrode mounted on said carrier adjacent one end thereof,

electrical signalling means coupled to the probe electrode for responding to electrostatically induced voltages thereon, said signalling means being responsive to induced voltages above a predetermined threshold level,

a tubular shielding plate surrounding the probe carrier and extending beyond said one end thereof,

an insulating spacer fixedly mounted on the tubular shielding plate and extending axially from one end thereof, the spacer having a free end configured to engage a conductor under test for locating the shielding plate with respect to the conductor,

means for moving the probe carrier axially within the tubular shielding plate whereby to vary the distance between the probe electrode and the conductor and so position the probe electrode with respect to the conductor to obtain a threshold response, and

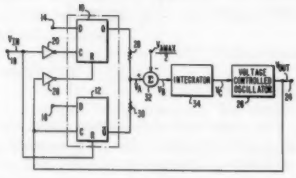
means for indicating the axial position of the probe electrode within the tubular shielding plate.

4,520,319

ELECTRONIC PHASE DETECTOR HAVING AN OUTPUT WHICH IS PROPORTIONAL TO THE PHASE DIFFERENCE BETWEEN TWO DATA SIGNALS

Donal E. Baker, American Township, Allen County, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 30, 1982, Ser. No. 430,576
Int. Cl.³ H03L *7/10*
U.S. Cl. 328—133 **9 Claims**



1. A phase detecting circuit comprising:

a first bistable circuit having a data input, a clock input, a reset input and a NOT Q output, wherein said first circuit data input is connected to a logic high signal and wherein said NOT Q output goes to a logic low state when a logic high signal is received at said first circuit clock input and said first circuit reset input is receiving a logic low signal, and said NOT Q output goes to a logic high state when a logic high signal is received at said first circuit reset input;

a second bistable circuit having a data input, a clock input, a reset input, and a Q output, wherein said second circuit data input is connected to a logic high signal and wherein said Q output goes to a logic high state when a logic high signal is received at said second circuit clock input and said second circuit reset input is receiving a logic low signal, and said Q output goes to a logic low state when a logic high signal is received at said second circuit reset input;

a first terminal for receiving a reference data signal;

a second terminal for receiving a second data signal;

means for connecting said first terminal to said first circuit reset input;

means for connecting said second terminal to said first circuit clock input;

a first inverting means connected between said first terminal and said second circuit clock input; and

a second inverting means connected between said second terminal and said second circuit reset input;

wherein the average value of the sum of voltages appearing on said Q and NOT Q outputs is proportional to the phase difference between the reference signal and the second signal.

4,520,320

SYNCHRONOUS PHASE MARKER AND AMPLITUDE DETECTOR

James E. Potzick, Potomac, and Baldwin Robertson, Bethesda, both of Md., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 300,830, Sep. 10, 1981, Pat. No. 4,445,389.
This application Feb. 22, 1984, Ser. No. 571,288
Int. Cl.³ H03K *9/06, 5/22, 5/24*
U.S. Cl. 328—133 **3 Claims**

1. A synchronous phase marker and amplitude detector for determining the relative amplitude and phase of a periodic signal obscured by noise with respect to a known reference signal, said detector comprising:

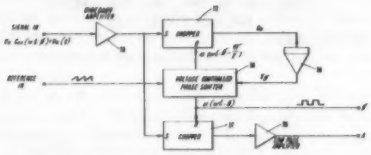
a first chopper having a signal input connected to the signal obscured by noise, a reference input and an output;

means for integrating the output of said first chopper;

variable phase shifting means, responsive to said integrating means output, for shifting the phase of said reference

signal, and phase shifted reference signal connected to said first chopper reference input; and

a second chopper having a signal input connected to said signal obscured by noise, a reference input and an output, said variable phase shifting means having a further output



with the phase shifted reference signal shifted an additional (n×90) degrees, where n is equal to any odd integer, said further output connected to said second chopper reference input, said further output comprising said required phase information and said second chopper output providing said obscured signal amplitude information.

4,520,321

PHASE DIFFERENCE DETECTOR WITH PHASE INVERSION OF ONE INPUT SIGNAL WHEN PHASE DIFFERENCE IS SMALL

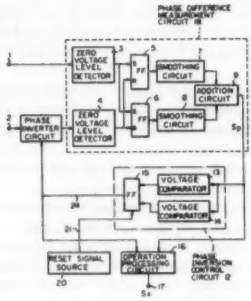
Kenji Nakatsugawa, and Hiroshi Itaya, both of Tokyo, Japan, assignors to Anritsu Electric Company Limited, Tokyo, Japan

Filed Nov. 30, 1982, Ser. No. 445,643

Claims priority, application Japan, Nov. 30, 1981, 56-191972

Int. Cl.³ G01R *25/00;* **H03K** *5/22*

U.S. Cl. 328—133 **5 Claims**



1. A phase detector for measuring a phase difference between a first AC signal and a second AC signal, comprising:

phase inverter circuit means coupled to receive said second AC signal, for producing an output signal;

phase difference measurement circuit means coupled to receive said first AC signal and said output signal from said phase inverter circuit means, for producing an output signal representing the phase difference between said first AC signal and said output signal from said phase inverter circuit means;

phase inversion control circuit means coupled to receive said output signal from said phase difference measurement circuit means, for producing a first phase inversion control signal if said output signal represents a phase difference which lies within a predetermined range of phase differences which includes a phase difference of zero, and for producing a second phase inversion control signal if said output signal from said phase difference measurement circuit means represents a phase difference which lies outside said predetermined range, said first and second output signals from said phase inversion control circuit means being applied to control the operation of said phase inverter circuit means, said phase inverter circuit means being responsive to said first phase inversion contrl signal for performing phase inversion of said second AC signal and transferring the resultant inverted signal to be produced as said output signal therefrom, and being responsive to said second phase inversion control signal for transferring said second AC signal directly without change in phase to be produced as said output signal therefrom; and

operation processing circuit means coupled to receive said first and second phase inversion control signals from said phase inversion control circuit means and said output signal from said phase difference measurement circuit means, and responsive to said second phase inversion control signal for producing an output signal corresponding to said phase difference measurement circuit means output signal, representing the phase difference between said first and second output signals, and responsive to said first phase inversion control signal for modifying said phase difference measurement circuit means output signal in a manner such as to compensate for said phase inversion produced by said phase inverter circuit means, to thereby produce an output signal correctly representing the phase difference between said first and second AC signals.

4,520,322

POWER AMPLIFIER HAVING IMPROVED POWER SUPPLY CIRCUIT

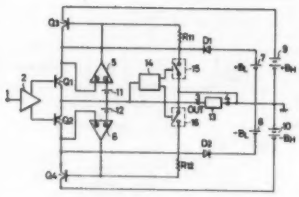
Satoshi Ishii, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,077

Claims priority, application Japan, Jan. 20, 1982, 57-6216[U]

Int. Cl.³ H03F *3/30*

U.S. Cl. 330—263 **5 Claims**

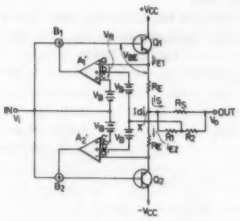


1. A power amplifier having an improved power supply circuit, comprising: a power amplifying stage with an output terminal; two first voltage supplies; two second voltage supplies having output voltages greater than output voltages of said first supplies; first and second differential amplifiers, said first differential amplifier having a first input terminal coupled to said power amplifying stage and said second differential amplifier having a first input terminal coupled to said power amplifying stage; first and second bias voltage supplies E connected between said output terminal and second input terminals of respective ones of said first and second differential amplifiers; first and second diodes coupling said first supplies to said power amplifying stage, respectively; first and second transistors having curent-carrying paths coupled between said power amplifying stage and said second supplies for coupling said second supplies to said power amplifying stage, bases of said first and second transistors being coupled to outputs of said first and second differential amplifiers, respectively; means for sensing a magnitude of a high frequency component of an output signal at said output terminal; and switching means for grounding said bases of said first and second transistors when an output signal of said high frequency component sensing means exceeds a predetermined level indicative of a predetermined magnitude of said high frequency component.

4,520,323
EMITTER FOLLOWER TYPE SEPP CIRCUIT

Kazuaki Nakayama, Tokyo, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Aug. 17, 1983, Ser. No. 524,174
Claims priority, application Japan, Aug. 20, 1982, 57-143388
Int. Cl.³ H03F *3/26*
U.S. Cl. 330—268 **5 Claims**

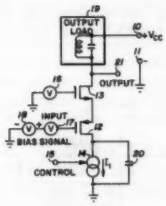


1. An emitter follower type SEPP current, comprising: first and second amplifier elements each configured in the emitter follower SEPP class "B" form; first and second error amplifiers provided corresponding to said first and second amplifiers and each having at least three input terminals; a first of the input terminals of said first and second error amplifiers is connected to a signal detector terminal for detecting a signal output current of a resistance network, a second of the input terminals of said first and second error amplifiers is connected to an input signal, and a third of the input terminals of said first and second error amplifiers is connected to an emitter of said output transistors; first and second voltage generator means incorporated between a circuit input and input terminals of said first and second amplifier elements for generating a voltage with the outputs of said corresponding error amplifier; and said resistance network including first and second idle detector terminals incorporated between output electrodes of said first and second amplifier elements and a circuit output end for detecting idle currents from said first and second amplifier elements, said error amplifiers being arranged in a feedback loop such that idle currents are made independent of the input signals applied to said circuit.

4,520,324
MOS GAIN CONTROLLED AMPLIFIER

William B. Jett, Jr., San Jose, and Milton E. Wilcox, Saratoga, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Mar. 11, 1983, Ser. No. 474,628
Int. Cl.³ H03F *3/16;* **H03G** *3/10*
U.S. Cl. 330—285 **6 Claims**



1. An MOS transistor variable gain amplifier circuit comprising:

a first MOS transistor having source, drain and gate electrodes;

supply rails connectable to a source of operating power for providing source and sink rails for the current carriers in said circuit;

a second MOS transistor complementary to said first MOS transistor and having source, drain and gate electrodes;

means for connecting said source of said second MOS transistor to said source of said first transistor;

means for connecting said gate of said second transistor to a source of potential which is selected to control the biasing of said source of said first MOS transistor;

means, responsive to a control potential, for varying the voltage between said source and said drain of said first MOS transistor;

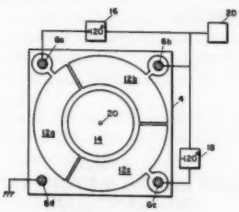
signal input means coupled to said first MOS transistor to modulate the current therein; and

load means coupled in series with the source-drain electrodes of said second MOS transistor for developing a signal output; whereby said first MOS transistor is operated in its resistive region below saturation and said circuit displays a gain between said signal input and said signal output that varies as a function of said control potential.

4,520,325
PHASE SHIFTERS

Gilbert A. Hoffman, Aloha, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 4, 1984, Ser. No. 596,793
Int. Cl.³ G01R *27/26;* **H03F** *3/191*
U.S. Cl. 330—302 **9 Claims**



1. A capacitive goniometer which comprises:

(A) a plurality of like conductive annular sectors;

(B) first means supporting said sectors in mutually substantially coplanar relationship, whereby said sectors define an axis which extends through the center of the annulus and is substantially perpendicular to the common plane of the sectors;

(C) a conductive member having a generally arcuate outer periphery;

(D) second means supporting said conductive member in spaced confronting relationship with said sectors with the outer periphery of the conductive member not extending substantially farther radially of said axis than the sectors, whereby an electrical signal applied to one of said sectors is capacitively coupled to said conductive member, said second means permitting relative angular movement of said conductive member and said first means about said axis; and

(E) output means coupled to said conductive member for making said electrical signal available.

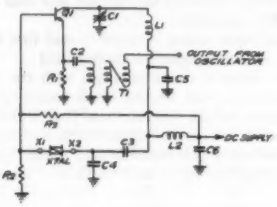
4,520,326
SINGLE-STAGE OSCILLATOR HAVING LOW-IMPEDANCE FEEDBACK PORT

Thomas G. Clemens, Glassboro, N.J., assignor to General Instrument Corporation, New York, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,883
Int. Cl.³ H03B *5/36;* **H03C** *3/22*
U.S. Cl. 331—116 R **12 Claims**

9. An oscillator circuit comprising an amplifying stage hav-

ing an input and an output, an input port and an output port across which a frequency-determining element is connected, the input of said amplifying stage being operatively connected to said output port, and means for establishing a low impedance at said input port, said last-mentioned means including a capacitive divider comprising a first capacitor operatively connected between the output of said amplifying stage and said input port and a second capacitor connected between said first



capacitor and a reference potential, the values of said first and second capacitors being selected such that the voltage division provided by said first and second capacitors is substantially the same over the frequency range of the oscillator, the impedance of said first capacitor being less than 5 ohms at the lowest oscillator operating frequency, and the impedance of said second capacitor being approximately 50 ohms at the lowest operating frequency.

4,520,327

OSCILLATOR HAVING MANUAL AND AUTOMATIC FREQUENCY CONTROL

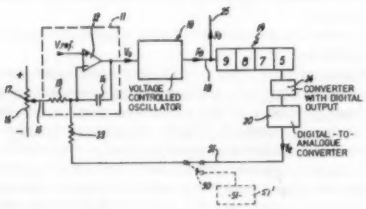
Roland Myers, 33 Withenfield Rd., Manchester M23 9BT, England

Filed Jun. 15, 1982, Ser. No. 388,630

Claims priority, application United Kingdom, Jun. 16, 1981, 8118398; Dec. 14, 1981, 8137591

Int. Cl.³ H03L *7/00*

U.S. Cl. 331—177 R **15 Claims**



1. An oscillator system comprising an oscillator having an input for receiving an input voltage, the oscillator providing an output signal whose frequency is responsive to the input voltage, means for deriving from the output signal, the frequency of which is considered as represented in digital form, a control voltage dependent on the difference between only a lower part of the output signal and a predetermined lower part, said predetermined lower part comprising the lowermost digit represented by the output signal, said control voltage arranged for varying said input voltage, and means for varying the input voltage.

4,520,328

AMPLITUDE MODULATION CIRCUIT HAVING STABLE MODULATION CHARACTERISTICS

Yoshihiro Murakami, Daito, and Nobukazu Hosoya, Ikoma, both of Japan, assignors to Sanyo Electric Co. Ltd., Osaka, Japan

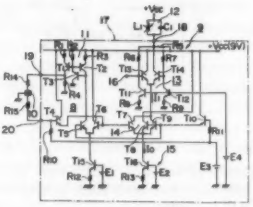
PCT No. PCT/JP82/00280, § 371 Date Mar. 21, 1983, § 102(e) Date Mar. 21, 1983, PCT Pub. No. WO83/00411, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 20, 1982, Ser. No. 479,069

Claims priority, application Japan, Jul. 20, 1981, 56-113848

Int. Cl.³ H03C *1/02*

U.S. Cl. 332—31 T **5 Claims**



1. An amplitude modulation circuit comprising a resonant circuit for the determination of a carrier wave frequency connected to the collector of one transistor of a differential pair of transistors forming a differential amplifier, said differential amplifier having its ground terminal connected to a constant current source; an output terminal of said resonant circuit being coupled to the base of the other transistor forming the differential pair so as to supply positive feedback to said other transistor thereby forming a carrier wave oscillator; and constant current adjusting means connected between said differential amplifier and said constant current source and also coupled to a modulating signal generating means so as to receive a modulating signal, said constant current adjusting means being operable to set two different current levels to be supplied to said differential pair, said two different current levels being set at respective positive and negative half-wave periods of said modulating signal.

4,520,329

CIRCUIT COMPONENT FOR SEPARATING AND/OR COMBINING TWO ISOFREQUENTIAL BUT DIFFERENTLY POLARIZED PAIRS OF SIGNAL WAVES LYING IN DIFFERENT HIGH-FREQUENCY BANDS

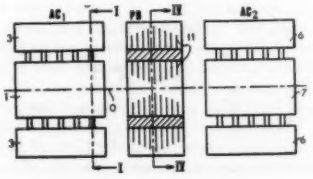
Enzo Cavalieri D'Oro, Monza, and Piero Vita, Barcellona Pozzo Di Gotto, both of Italy, assignors to Italtel Societa Italiana Telecomunicazioni S.p.A., Milan, Italy

Filed Feb. 23, 1983, Ser. No. 469,141

Claims priority, application Italy, Feb. 25, 1982, 19845 A/82

Int. Cl.³ H01P *1/213*

U.S. Cl. 333—135 **5 Claims**



1. A circuit component enabling the separation of four different high frequency signal waves constituting two signal

pairs, each signal pair having signals in different planes of polarization and each signal pair lying in a different frequency band,

comprising:

a first and a second 3 dB coupler of substantially identical structure aligned with each other and centered on a common axis; and

filter means axially aligned with and bracketed between said couplers;

each of said couplers including a central guide and four collateral guides symmetrically disposed with reference to said axis, said central guide of said first coupler enabling propagation of all four signal waves applied to a free end thereof, each of said couplers including said central guide being coupled with said collateral guides by way of respective pairs of coupling guides, a first pair of said coupling guides giving passage to signal waves in either frequency band polarized in a first plane in which said first pair of coupling guides are oriented, a second pair of said coupling guides giving passage to signal waves in either frequency band polarized in a second plane in which said second pair of coupling guides are oriented, said filter means being a wave-reflecting body with a central cutout and four collateral cutouts, respectively aligned with the central and collateral guides of said first and second couplers, said cutouts being occupied by filtering elements of band-pass character passing only signal waves of one of said bands while reflecting the others toward the coupler through which they have been applied.

4,520,330

ELECTRONIC COMPONENT FUNCTIONING WITH REFLECTED ACOUSTIC WAVES

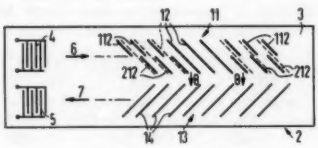
Gerd Riha, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 4, 1983, Ser. No. 520,418

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3230038

Int. Cl.³ H03H *9/64, 9/145*

U.S. Cl. 333—195 **6 Claims**



1. An electronic component functioning with reflected acoustic waves on a substrate and which has a reflector structure, input means for transmitting a primary wave, and output means for receiving a reflected wave, and wherein the reflector structure has finger weighting by means of displacing a position of strip-like fingers to be weighted, wherein the improvement comprises: the strip-like fingers to be weighted are functionally divided at least once in their longitudinal direction so as to create sub-fingers; and the sub-fingers are offset relative to one another in a primary wave propagation direction by a dimension corresponding to a prescribed weighting.

4,520,331

ROTARY ACTUATOR FOR A MICROWAVE SWITCH

Clinton F. Steidel, La Mirada, Calif., assignor to Transco Products, Inc., Marina Del Rey, Calif.

Filed Dec. 27, 1983, Ser. No. 565,880

Int. Cl.³ H01H *67/02*

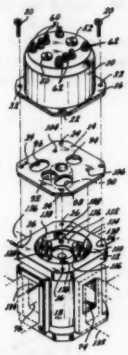
U.S. Cl. 335—125 **22 Claims**

12. A rotary actuator for a microwave switch, including,

a stationary armature including at least one core positioned along a particular axis and with a coil means wound around the core to form at least one electromagnet and with the polarity at the end of the core in accordance with the direction of current flow through the coil means upon the application of electrical energy to the coil means,

a rotor positioned adjacent to one end of the core and with the rotor supported for rotation in a plane perpendicular to the particular axis of the core,

the rotor including a plurality of spaced permanent magnets located axially relative to the one end of the one core and



with the application of electrical energy to the coil means providing axial excitation to produce magnetic interaction between the permanent magnets and the core and provide rotary travel of the rotor in one of two opposite directions in accordance with the direction of current flow through the coil means, and

stop means located in the path of rotation of the rotor to engage a portion of the rotor to limit the travel of the rotor between fixed positions.

4,520,332

SOLENOID WITH INTERNALLY LOCATED SWITCH CONTACTS

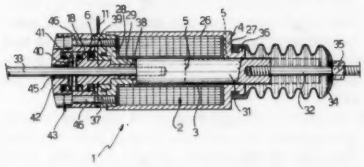
Carlo Tagliafico, Rivoli, Italy, assignor to Costruzioni Elettromagnetiche Industriali di Tagliafico Carlo, Turin, Italy

Filed Jul. 25, 1983, Ser. No. 517,072

Claims priority, application Italy, Jul. 29, 1982, 53584/82[U]

Int. Cl.³ H01H *67/02*

U.S. Cl. 335—126 **7 Claims**



1. An electromagnet of the type comprising an excitation coil wound as a solenoid and having at least two windings which can be supplied selectively, a fixed core fixedly mounted with respect to said coil, a movable core movable axially with respect to said coil and an electrical switch which can be actuated by said movable core for selectively supplying said two windings, said electromagnet being characterised by first and second shafts extending from opposite axial ends of said movable core;

a piston having an axial through hole surrounding said second shaft and axially slidable relative to said fixed core under the action of said movable core;

an annular flange on said piston;

said switch including a plurality of movable contacts riveted to an annular conductive plate fixed to said flange; and

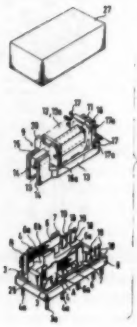
said switch further including a plurality of fixed contacts mounted rigidly with respect to said fixed core.

4,520,333

M.B.B. TYPE CONTACT ARRANGEMENT FOR AN ELECTROMAGNETIC RELAY

Mitsuki Nagamoto, Kadoma, Japan, assignor to Matsushita Electric Works, Ltd., Japan and SDS-Elektro GmbH, Fed. Rep. of Germany

Filed Apr. 26, 1983, Ser. No. 488,695
Claims priority, application Japan, Apr. 30, 1982, 57-73633
Int. Cl.³ H01H *67/02, 1/28*
U.S. Cl. 335—129 **6 Claims**



1. An M.B.B. type contact arrangement comprising

first and second contact spring means having contact portions juxtaposed in a first direction and movable in a second direction extending transversely to said first direction,

a first fixed contact member forming a first contact couple with the contact portion of said first spring means, and a second fixed contact member forming a second contact couple with the contact portion of said second spring means, said first and second fixed contact members being disposed on opposite sides of said juxtaposed contact spring means and spaced apart along said second direction,

an actuating member movable along said second direction and having an edge with a step separating a first section of said edge from a second section thereof, said first and second edge sections being adapted to move said first and second contact spring means, respectively, into and out of engagement with said first and second fixed contact members,

the height of said step being so dimensioned in relation to the spacing between said fixed contact members that, in either direction of movement of said actuating member, one contact couple is closed before the other is opened.

4,520,334

PUSHBUTTON SWITCH WITH REMOTELY CONTROLLED OPERATING ATTACHMENT

John W. Stearley, Smithfield, and Tony O. Woodard, Pine Level, both of N.C., assignors to Eaton Corporation, Cleveland, Ohio

Filed Oct. 28, 1983, Ser. No. 546,704
Int. Cl.³ H01H *3/02, 45/02*
U.S. Cl. 335—186 **16 Claims**

1. An electric switch comprising, in combination:

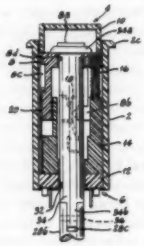
a switch housing;

switch contact means in said housing;

pushbutton operator means movably mounted to said housing;

means biasing said pushbutton operator means to a first position;

said pushbutton operator means being manually depressible to a second position for actuating said switch contact means and for operating a latch means for latching said pushbutton operator means in said second position, said pushbutton operator means being manually depressible from said second position for releasing said latch means to permit said biasing means to return said pushbutton operator means to said first position, thereby deactuating said switch contact means;



an opening in said switch housing;

auxiliary means mounted proximate said housing for effecting depression of said pushbutton operator means in response to a control signal, comprising:

electromagnetic means fixedly positioned with respect to said housing and having armature means movable in response to energization of said electromagnetic means by said control signal; and

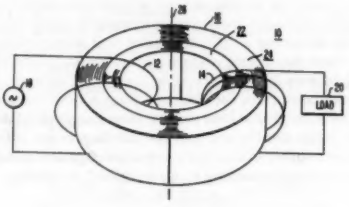
coupling means extending through said opening having connection with said pushbutton operator means and said armature means.

4,520,335

TRANSFORMER WITH FERROMAGNETIC CIRCUITS OF UNEQUAL SATURATION INDUCTIONS

Gary C. Rauch, and Robert F. Krause, both of Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 6, 1983, Ser. No. 482,681
Int. Cl.³ H01F *27/24*
U.S. Cl. 336—212 **18 Claims**



1. A ferromagnetic core, for use in a power transformer having an operation induction, B, wherein said core comprises:

a plurality of ferromagnetic circuits;

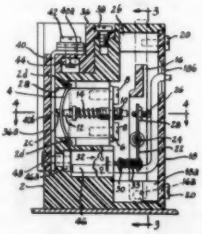
said plurality of ferromagnetic circuits being constructed of at least two ferromagnetic materials having different saturation limited inductions;

a first ferromagnetic circuit of said plurality of ferromagnetic circuits being constructed of an iron base amorphous material having a saturation limited induction, B_1;

a second ferromagnetic circuit of said plurality of ferromag-

netic circuits being constructed of a grain oriented electrical steel having a saturation limited induction, B_2;
and wherein said operating induction, B is between B_1 and B_2.

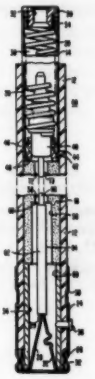
4,520,336
ELECTROTHERMALLY ACTUATED SWITCH
Jerome K. Hastings, Sussex; John R. Brubaker, Milwaukee, and John W. Kroll, Greendale, all of Wis., assignors to Eaton Corporation, Cleveland, Ohio
Filed Dec. 1, 1983, Ser. No. 557,130
Int. Cl.³ H01H *61/06, 71/18*
U.S. Cl. 337—140 **15 Claims**



1. An electrothermally actuated switch comprising, in combination:
switch means;
a heater for receiving current flow therein producing heat levels indicative of the current levels flowing therein;
thermally responsive means having an initial position in heat conducting proximity to said heater establishing a coefficient of heat transfer from said heater to said thermally responsive means, said thermally responsive means being temperature actuated for progressive movement away from said heater and operable upon a predetermined amount of said movement for actuating said switch means;
and wherein said progressive movement of said thermally responsive means within said predetermined amount of said movement progressively decreases said coefficient of heat transfer thereby requiring increased current levels and resulting heat levels for maintaining said progressive movement of said thermally responsive means, thereby to extend a range of current levels at which switch actuation occurs.

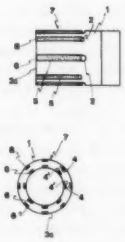
4,520,337
BORIC ACID EXPULSION FUSE
Frank L. Cameron, North Huntingdon, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jul. 23, 1984, Ser. No. 633,813
Int. Cl.³ H01H *85/38*
U.S. Cl. 337—275 **6 Claims**

1. A high voltage circuit interrupter comprising:
(a) tubular means of insulating material capable of providing an arc-extinguishing gas when in proximity to an electric arc;
(b) the tubular means including an arc passage having one end portion larger than the other end portion;
(c) terminal means at each end of the tubular means;
(d) a conductor within the passage and having one end portion larger than the other end portion and forming a clearance space with the walls forming the passage;
(e) the conductor being connected to the terminal at one end of the tubular means;
(f) fusible means extending between the terminal means at the other end of the tubular means and the conductor; and



(g) moving means at one end of the conductor for moving the conductor in the direction of the smaller end portion upon fusion of the fusible means.

4,520,338
CYLINDRICAL FUSE
Yukinobu Watanabe, 14-13 Nakamachi 3-chome, Kiryu-shi Gumma-ken, Japan
Filed Jul. 7, 1983, Ser. No. 511,647
Claims priority, application Japan, Jul. 7, 1982, 57-117910; Feb. 2, 1983, 58-25927
Int. Cl.³ H01H *85/04*
U.S. Cl. 337—297 **2 Claims**



1. A cylindrical fuse comprising:
(a) a tubular cylindrical electrical insulator member formed of glass, porcelain, ceramic or plastic and containing a plurality of longitudinally extending, circumferentially spaced grooves on the inner and outer surfaces thereof, each corresponding inner and outer grooves being connected at one end by a through-hole aperture;
(b) fuse portions arranged in the grooves and extending through the through-hole apertures to connect the corresponding inner and outer groove fuse portions, said fuse portions comprising a metal having a low melting point, the outer surfaces of said groove fuse portions being flush with the cylindrical surface of said insulator member, and

(c) a plurality of fuse terminals formed in the end of said insulator member adjacent the ends of said groove fuse portions, the outer surfaces of said fuse terminals being flush with the end and cylindrical surfaces of said insulator member.

4,520,339

LOAD CELL WITH ADJUSTABLE BRIDGE CIRCUIT

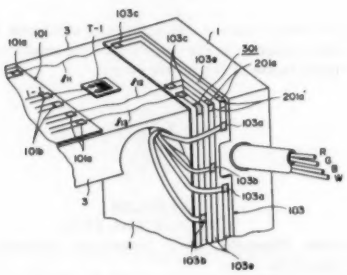
Michito Utsunomiya, Kusatsu, Japan, assignor to Kabushiki Kaish Ishida Koki Seisakusho, Kyoto, Japan

Filed Apr. 25, 1983, Ser. No. 487,971

Claims priority, application Japan, Apr. 26, 1982, 57-60942[U]; Apr. 26, 1982, 57-60943[U]

Int. Cl.³ G01L *1/22;* **G01G** *3/14;* **H05K** *1/00, 3/22*

U.S. Cl. 338—5 **4 Claims**



1. A load cell for converting the magnitude of an applied load into an electrical signal, comprising:

a load cell body including

a stationary mounting portion,

a portion for receiving an applied load, and

a pair of parallel, flexible beams joining said stationary mounting portion and said load-receiving portion, each of said flexible beams having portions of reduced thickness;

a respective pair of strain gauges provided on each said flexible beam, each at a respective one of said portions of reduced thickness; and

a flexible external lead circuit board which is bent at two respective bending portions thereof and attached to three respective sides of said stationary mounting portion of said load cell body, said flexible external lead circuit board having a wiring pattern formed thereon, with soldering portions on either side of said bending portions, and a plurality of terminals;

a respective intermediate terminal board located on each of said flexible beams between the respective pair of strain gauges and having wiring patterns and terminals for connection to the respective strain gauges, for connection to respective terminals of said external lead circuit board and further for selective connection of compensation elements thereto,

lead wires for connecting said strain gauges with respective ones of said terminals of the respective intermediate terminal boards, and respective terminals of the intermediate terminal boards with respective terminals of the external lead circuit board, to form a bridge circuit.

4,520,340

CAMERA WITH PRINTED CIRCUIT BOARDS COMPRISING RESISTANCE-CONDUCTOR LAMINATED CONSTRUCTIONS

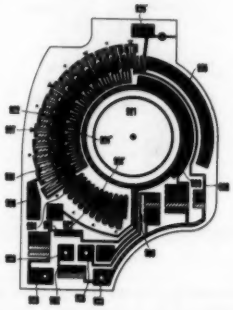
Masami Shimizu; Junji Omi, both of Tokyo; Kunio Watanabe, Kanagawa; Masanori Uchidoi, Kanagawa, and Hiroshi Aizawa, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 171,329, Jul. 23, 1980, Pat. No. 4,359,277, which is a continuation of Ser. No. 898,147, Apr. 20, 1978, abandoned, which is a continuation of Ser. No. 795,609, May 10, 1977, abandoned. This application Jun. 11, 1982, Ser. No. 387,450

Claims priority, application Japan, May 24, 1976, 51-59894; May 24, 1976, 51-59895; Jul. 7, 1976, 51-80540; Feb. 1, 1977, 52-10013

Int. Cl.³ H01C *10/00, 10/46*

U.S. Cl. 338—195 **3 Claims**



1. An electrical component for a variable resistor comprising:

(a) an electrically insulated baseboard member;

(b) a resistor layer constituting resistance elements laminated on the baseboard member;

(c) a plurality of fixed electrodes laminated on the resistor layer at a certain determined distance between each other, said plurality of fixed electrodes being arranged concentrically; and

(d) movable contact electrode means slidable on the fixed electrodes, the resistance element including fixed resistance portions positioned between adjacent electrodes and having a predetermined resistance value, and adjustable resistance portions which can be selectively removed so as to adjust the resistance value, and said adjustable resistance portions being ladder shaped so as to adjust the resistance value by trimming operation of each ladder portion.

4,520,341

MOISTURE RESPONSIVE ELEMENT WITH CROSSLINKED ORGANIC MEMBRANE AND PROTECTIVE LAYERING

Shuji Miyoshi, Osaka; Takashi Sugihara, Tenri; Akihito Jinda, Nara, and Masaya Hijikigawa, Yamatokouriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1982, Ser. No. 446,405

Claims priority, application Japan, Dec. 8, 1981, 56-198027; Apr. 14, 1982, 57-62791

Int. Cl.³ H01C *3/00;* **G01N** *27/12;* **H01C** *7/00*

U.S. Cl. 338—35 **7 Claims**

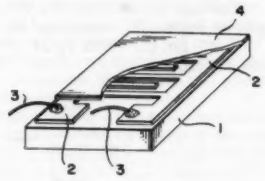
1. A moisture responsive element consisting essentially of:

an electrically non-conductive base plate;

a pair of spaced electrodes fixed on said base plate;

a moisture responsive organic membrane comprising an organic monomer and crosslinking agent consisting essen-

tially of material selected from the group consisting of crosslinked polystyrene sulfonic acid and salt of polystyrene sulfonic acid extending over said pair of electrodes; and



a protective layer consisting essentially of material selected from the group consisting of cellulose acetate and polyvinyl acetate coated on said moisture responsive organic membrane.

4,520,342

RESISTOR

Ludovicus Vugts, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1983, Ser. No. 516,822

Claims priority, application Netherlands, Aug. 24, 1982, 8203297

Int. Cl.³ H01C *1/012*

U.S. Cl. 338—308 **3 Claims**

1. A resistor comprising an insulating substrate on which a thin layer of a chromium silicon alloy is attached, said layer having the composition $CrSi_x$, where $1 \leqq x \leqq 5$, said layer being doped by nitrogen, characterized in that:

said substrate has two superimposed layers, one of said layers consisting of said doped chromium silicon alloy containing nitrogen in a quantity of at least 1 at.% and at most 10 at.%; and the other layer consisting of said chromium silicon alloy in the non-doped state.

4,520,343

LIFT CONTROL SYSTEM

Hiroshi Koh, 207, Ōi-cho, Tanaka, Sakyo-ku, Kyoto-shi, Kyoto-fu, and Junichi Hirota, Tonda-Danchi #69-303, Makita-cho, Takatsuki-shi, Osaka-fu, both of Japan

Filed Dec. 15, 1981, Ser. No. 331,087

Claims priority, application Japan, Dec. 16, 1980, 55-178524; Jun. 27, 1981, 56-100241

Int. Cl.³ B66B *3/00*

U.S. Cl. 340—19 R **12 Claims**

1. In a lift system including a cage for carrying passengers up and down in a shaft and a mechanically-driven door at each floor the cage is to stop to allow ingress and egress of passengers, a control system for at least controlling operation of the mechanical door in response to passengers desiring to load on the lift, said control system comprising:

a spatial filter inside the cage of the lift, said spatial filter including a fence reticle with the reticle stripes oriented in a parallel relationship to the movement of the mechanical door;

discriminating means for discriminating between signals below and above a predetermined level as received from said spatial filter, and for producing a control signal when the signals are above the predetermined level; and

active means connected to said discriminating means for controlling closure of said door.

4,520,344

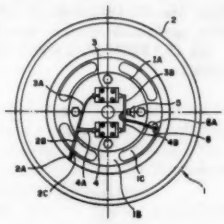
WHEEL TROUBLE DETECTING AND WARNING DEVICE

Si-Yan Shu, and Shing-Wu P. Tzeng, both of No. 124, Long Tong Rd., Chung Li, Taiwan

Filed Aug. 10, 1982, Ser. No. 406,953

Int. Cl.³ B60C *23/02*

U.S. Cl. 340—58 **4 Claims**



1. A wheel trouble detecting and warning device for wheeled motor vehicles provided with air-inflated tires, comprising:

an air horn mounted onto a wheel hub of a wheel of the vehicle;

a first valve unit mounted on the wheel hub, to which first valve unit air from the tire is supplied, said first valve unit being adapted to allow air from the tire to be admitted to said air horn when the pressure of the air decreases below a pre-determined lower limit, said first valve unit including a first bore having a first end and a second end, a first check valve adapted to allow air from the tire to flow one way into said first bore from said first end, a by-pass having an inlet port open to said first end of said first bore and an outlet port open to said first bore, said outlet port being disposed at a suitable distance from said inlet port, a first piston slidably inserted in said first bore, a spring adapted to urge said piston towards said first end, a second check valve adapted to allow air to flow one way from said second end of said first bore to said air horn, a needle valve adapted to selectively open and close said outlet port of said by-pass, said first piston and spring being so arranged that said first piston is disposed to allow said outlet port to communicate with said second end to form a passage when the pressure of air from the tire decreases below said predetermined lower limit; and

a second valve unit mounted on the wheel hub, to which second valve unit air from the tire is supplied, said second valve unit being adapted to allow air from the tire to be admitted to said air horn when the pressure of the air from the tire increases beyond a predetermined upper limit, said second valve unit including a second bore having a first end and a second end, a third check valve adapted to allow air from the tire to flow one way into said second bore from said first end of said second bore, a second by-pass having an inlet port open to said second bore and an outlet provided with a fourth check value which is adapted to allow air from said second by-pass to flow one way to said air horn, a second piston slidably inserted in said second bore, a second spring adapted to urge said

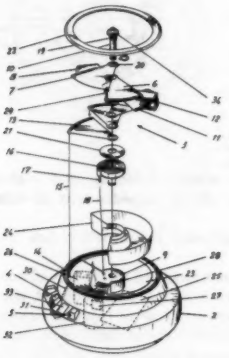
second piston toward said first end of said second bore, a restriction means adapted to restrict the movement of said second piston when the pressure of the air from the tire increases suddenly, said second piston and second spring being so arranged to communicate said first end of said second bore with said inlet port of said second by-pass to form a passage when the pressure of air from the tire increases beyond the pre-determined upper limit and to close said inlet port of said second by-pass when the pressure of air from the tire is below the predetermined upper limit.

4,520,345

ASH TRAY HAVING FIRE PROTECTING ACTIVITY

Karlo Smit, Nybrogatan 76, S-114 41 Stockholm, Sweden

Filed Apr. 27, 1982, Ser. No. 372,439
Claims priority, application Sweden, Apr. 27, 1981, 8102668
Int. Cl.³ F23N *5/26*; G08B *1/00*
U.S. Cl. 340—309.2 **6 Claims**



1. An ash tray whereby a smoker is alerted to possible fire danger due to lighted smoking material that has been forgotton or misplaced, comprising a tray body wherein there is an upwardly opening ash receptacle, an electrically operated alarm device for producing a perceptible alarm signal, and current supply means for energizing said alarm device, said ash tray being characterized by:

A. time delay circuit means energizable from said current supply means and connected with said alarm device to provide for energizing the same after the time delay circuit means has been connected with said current supply means continuously through a predetermined period of time;

B. a normally open switch in said tray body, connected between said current supply means and said time delay circuit means and closure of which connects the time delay circuit means with the current supply means;

C. a lid on said tray body, movable relative thereto in opposite directions to and from a closed position overlying said ash receptacle to prevent deposit of ashes into the same; and

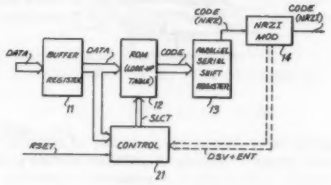
D. cooperating actuating means on said switch and on said lid whereby movement of said lid away from its closed position closes said switch and thus initiates a period of energization of the time delay circuit means and whereby movement of said lid back to its closed position reopens the switch and terminates energization of the time delay circuit means.

4,520,346

METHOD AND APPARATUS FOR ENCODING AN NRZI DIGITAL SIGNAL WITH LOW DC COMPONENT

Toshiyuki Shimada, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 23, 1982, Ser. No. 371,284
Claims priority, application Japan, Apr. 24, 1981, 56-62726
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **29 Claims**



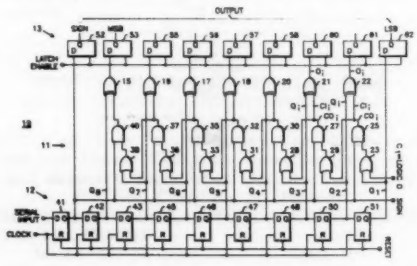
1. A method of converting successive n-bit information words into successive m-bit NRZI code words, with m>n, comprising the steps of assigning to each n-bit information word at least one m-bit code word having a respective NRZI disparity such that at least some of said n-bit information words are assigned with respective pairs of m-bit code words, each said respective pair of m-bit code words having a positive NRZI disparity code word and a negative NRZI disparity code word, the absolute values of the disparaties of the code words in each said respective pair being unequal; determining the digital sum variation of the preceding successive m-bit NRZI code words; detecting the polarity of the conclusion of the immediately preceding m-bit NRZI code word; selecting an assigned m-bit code word to represent the next n-bit information word as a function of the NRZI disparity of the selected code word and the determined digital sum variation; and modulating a code signal in NRZI format in accordance with said selected m-bit code word such that the modulated code signal has the same initial polarity as said detected polarity, and the NRZI disparity of said selected m-bit code word, when combined with said determined digital sum variation, tends to prevent the digital sum variation from increasing.

4,520,347

CODE CONVERSION CIRCUIT

Jules D. Campbell, Jr., Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 22, 1982, Ser. No. 443,352
Int. Cl.³ H03K *13/24*
U.S. Cl. 340—347 DD **8 Claims**



1. A code conversion circuit, for converting an n-bit binary number having a sign bit and n−1 magnitude bits in two's complement code to sign-magnitude code, where n is an integer, comprising:

coupling means for directly outputting a least significant bit

and the sign bit of the binary number in two's complement code; and

a rank ordered plurality of logic gates for providing a plurality of rank ordered magnitude bit by outputting the remainder of said n−1 magnitude bits if said binary number is positive, and otherwise identifying the least significant bit of said n−1 magnitude bits having a logic one value and inverting only the remainder of said n−1 magnitude bits of higher significance before outputting the remainder of said n−1 magnitude bits, each of said plurality of logic gates comprising:

first logic means having a first input coupled to a carry in signal indicative of the logic state of the magnitude bit of next lower significance, a second input coupled to a respective one of the n−1 magnitude bits of said binary number, and an output;

second logic means having a first input coupled to the output of the first logic means, a second input coupled to the sign bit of the n-bit number, and an output; and

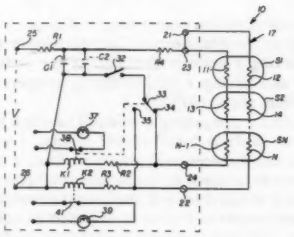
third logic means having a first input coupled to the output of the second logic means, a second input coupled to the magnitude bit of next higher significance than the magnitude bit which the second input of the first logic means is coupled to, and an output, for providing a predetermined bit of the binary number in sign-magnitude code.

4,520,348

MULTIPLE REDUNDANT SUPPRESSION DEVICES WITH PROVISION OF SUPERVISION AND FAULT CORRECTION

Carl I. Swanson, Boylston, Mass., assignor to Kidde, Inc., Saddle Brook, N.J.

Filed Jul. 13, 1983, Ser. No. 513,327
Int. Cl.³ G08B *29/00;* **A62C** *37/18*
U.S. Cl. 340—508 **16 Claims**



1. An electrical protection system comprising:

a plurality of suppressor units activatable to suppress an abnormal condition;

first and second electrical current responsive activators associated with each of said suppressor units and each energizable to induce activation thereof;

a first connector circuit connecting all of said first activators in series;

a second connector circuit connecting all of said second activators in series;

a supervisory electrical current source means;

an activation electrical current source means; and

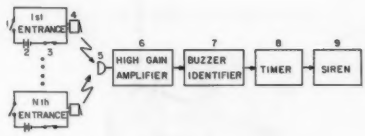
control circuit means connected between said supervisory and activation source and said first and second connector circuits, said control circuit means connecting said supervisory source means in parallel with said first and second connector circuits so as to provide a predetermined supervisory current flow therethrough, said supervisory current being insufficient to energize said activators, said control circuit means comprising an initiator means for selectively connecting said activation source means to said first and second connector circuits so as to provide therethrough an activation current flow greater than said supervisory current flow and sufficient to energize said activators to activate said suppressor units, and wherein said control circuit means further comprises monitor means for monitoring said supervisory current flow through said first and second connector circuits.

4,520,349

ALARM SYSTEM ACTIVATED BY BUZZERS

Vincent Varano, 5816 Claude St., Montreal North, Quebec, Canada H1G 1V2

Filed Apr. 12, 1982, Ser. No. 367,547
Claims priority, application Canada, Apr. 24, 1981, 376178
Int. Cl.³ G08B *13/00, 25/00*
U.S. Cl. 340—531 **4 Claims**



1. An alarm system to be activated by an intruder at any protected entrance of a premise having a plurality of protected entrances and producing an alarm sound at the intruded upon protected entrance and subsequently an alarm sound at a central location in the premise, wherein:

each protected entrance has a sensor switch attached thereto, the sensor switch attached to any intruded upon protected entrance being switched by the entrance of the intruder threat, each protected entrance having a buzzer thereat, the buzzer at any intruded upon protected entrance activated with power from a battery switched by the sensor switch attached to the intruded upon protected entrance, whereby the buzzer associated with the intruded upon entrance is activated and emits said alarm sound at the intruded upon protected entrance, the sound produced by different buzzers in the alarm system being substantially identical, and wherein said alarm system further comprises;

a microphone proximate said central location to receive sound from any activated buzzer and convert said sound into a varying electrical signal,

a front-end comparator means whereby said varying electrical signal is compared to a threshold level, simultaneously amplified when beyond said threshold level, and converted to a pulse sequence signal of two states as given by the output of said comparator means,

a capacitor means post said front-end comparator means whereby charging of said capacitor means is altered by said pulse sequence signal,

and a comparator means post said capacitor means whereby an alarm at said central location is activated when the charging of said capacitor means reaches a voltage threshold level.

4,520,350

MAIL BOX WITH REMOTE INDICATOR

Henry C. Huang, 12 Traymore St., Cambridge, Mass. 02140

Filed Sep. 20, 1982, Ser. No. 419,961
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—569 **3 Claims**

1. A mail box alarm system comprising

a mail box having

a door manually movable between open and closed positions and a signal flag manually movable between first and second positions, said signal flag being positioned substantially vertically in an alert position when in its said first position and in a substantially horizontal posi-

tion in a non-alert position when in its said second position,

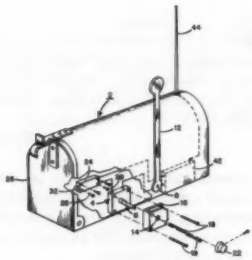
a transmitter associated with said mail box,

a power source having a connection to said transmitter,

an antenna coupled to said transmitter,

an interrupt switch operated by movement of said signal flag and arranged to prevent radiation by said transmitter when said signal flag is in its first position,

transmitter control means responsive to the movement of said door arranged to cause said transmitter to radiate a signal each time said door is moved between its said open and closed positions when said flag is in its said second position, said transmitter control means including an impulse switch connected in series with said interrupt switch between said power source and said transmitter and arranged to interrupt said connection between said power source and said transmitter when said door is in either its closed or open position and to complete said connection when said door is at a position between its said open and closed positions,



a receiver remotely positioned from said transmitter arranged to respond to signals radiated by said transmitter,

alarm means including a visual alarm and an audible alarm coupled to said receiver, and

a multiple-position stepping switch coupled to said receiver and said alarm means, wherein said stepping switch is arranged to be advanced through a repeating succession of positions by the received signals, and said alarm means are selectively energized in accordance with the position of said stepping switch.

4,520,351

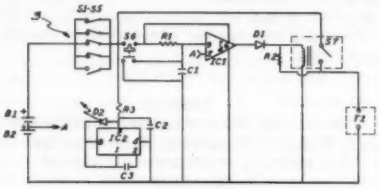
PASSIVE PERSONAL ALARM DEVICE

Sidney Altman, 71 Blake Rd., Hamden, Conn. 06517, and Dan Kasha, 84 Bayard Ave., North Haven, Conn. 06473

Filed Mar. 8, 1982, Ser. No. 356,044

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—574 **12 Claims**



1. A personal alarm device of the type comprising:

a. a housing;

b. a warning device and a battery both disposed in said housing; and

c. first switch means nonremovably connected to said housing and biased toward a closed setting;

d. said warning device, said battery and said first switch means being connected in series; the improvement comprising: second switch means, connected in series in said first circuit, having a plurality of settings of which a relatively small number are open settings and the remainder are closed settings, the ones of said open settings being indistinguishable from the ones of said closed settings by mere external examination of said alarm device.

4,520,352

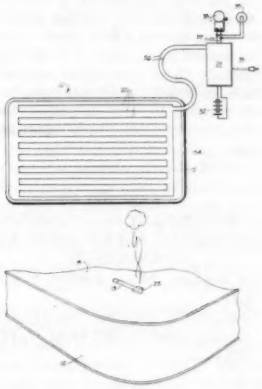
FIRE ALARM SYSTEM AND METHOD

Willard A. Domingue, Houston, Tex., assignor to Fire Trumpet of America, Inc., Houston, Tex.

Filed Jun. 20, 1983, Ser. No. 506,206

Int. Cl.³ G08B *17/02*

U.S. Cl. 340—590 **6 Claims**



1. A fire alarm system comprising:

(a) a pair of flexible sheets of heat-shrinkable plastic film each having a uniform thickness of the order of about 0.030" and having a heat shrinking temperature in the range from about 140°–250° F.,

(b) a conductor comprising a wire foil having a thickness of the order of about 0.002"–0.004" forming a series circuit sandwiched between said sheets to form a laminate of substantially uniform thickness and configured such that migration of said sheet will interrupt the continuity of said conductor when said sheet is subjected to sufficient heat to cause such heat migration, said sandwich of plastic film sheets and said conductor foil having sufficient physical strength to permit use under conditions of physical stress,

(c) circuit continuity monitoring means connected to said conductor to detect interruption thereof, thereby detecting application of a level of heat to said substrate gerat enough to cause such migration, and

(d) an alarm connected to said circuit monitoring means generating an alarm signal upon detection of the interruption of the continuity of said conductor.

4,520,353

STATE OF CHARGE INDICATOR

Robert E. McAuliffe, Lincoln, Nebr., assignor to Outboard Marine Corporation, Waukegan, Ill.

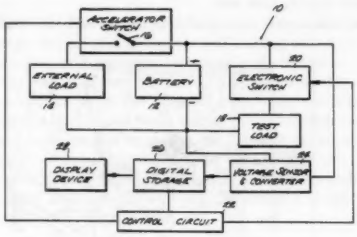
Filed Mar. 26, 1982, Ser. No. 362,548

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—636 **25 Claims**

1. A state of charge indicator for testing the state of charge of a battery selectively connected to an operating load, said state of charge indicator comprising means for sensing if the battery is connected to the operating load, timing means for sensing how long the battery is connected to the operating load, a test load, means for connecting said test load to the

battery in response to indication from said load connection sensing means of disconnection of the battery from the operating load after indication from said timing means that the battery was connected to the operating load for a predetermined period of time, and means for producing in response to said test load being connected to the battery a signal indicating the state of charge of the battery.



4,520,354

DISPLAY DEVICE FOR COPYING APPARATUS

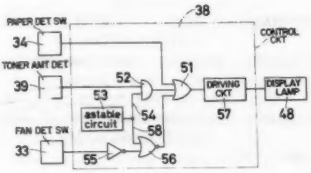
Tadashi Umeda; Hideo Miyoshi; Keiichi Kishimoto; Kazumi Iida; Kazunori Akiyama; Yuji Abe, and Masato Taniguchi, all of Osaka, Japan, assignors to Mita Industrial Company Limited, Osaka, Japan

Filed Jun. 30, 1982, Ser. No. 393,872

Claims priority, application Japan, Jun. 30, 1981, 56-102943

Int. Cl.³ G08B *21/00*

U.S. Cl. 340—679 **2 Claims**



1. A display device for a copying apparatus comprising:

first and second and third detecting means for detecting a plurality of operating conditions of said apparatus, each of said detecting means generating a high level output signal corresponding to a first predetermined operating condition and a low level signal corresponding to a second predetermined operating condition;

a display element for indicating said operating conditions detected by said first and second and third detecting means;

an astable multivibrator means for generating an output signal comprising a train of pulses whose ON period is unequal to its OFF period;

an AND gate means operatively connected to said second detector means and said astable multivibrator means;

an inverter means operatively connected to said third detector means for providing an output which is inverted with respect to said output of said third detecting means;

a NOR gate means operatively connected to said astable multivibrator means and said inverter means;

an OR gate means operatively connected to said first detecting means and said AND gate means and said NOR gate means;

a driving circuit means operatively connected between an output of said OR gate means and said display means for driving said display means in response to an output from said OR gate means;

wherein said display means indicates said operating condition detected by said first and second and third detecting means by respectively providing a steady light output and a blinking light output of a first duty cycle and a blinking light output of a second duty cycle, said first and second duty cycles corresponding to a duty cycle of said output of said astable multivibrator means and a duty cycle of an inverted output of said output of said astable multivibrator means.

4,520,355

JOYSTICK APPARATUS

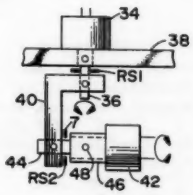
John H. Mitch, Portland, Oreg., assignor to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 16, 1982, Ser. No. 399,022

Claims priority, application Japan, Oct. 31, 1981, 56-163676[U]

Int. Cl.³ G09G *1/00;* **G06F** *3/14*

U.S. Cl. 340—709 **5 Claims**



1. A joystick apparatus comprising:

first means including a rotatable shaft disposed therethrough for developing an electrical signal in accordance with the degree of rotation of said shaft, said first means being rigidly mounted on a frame;

second means including a rotatable shaft disposed therethrough for developing an electrical signal in accordance with the degree of rotation of said shaft, said second means having a base extending from and rigidly affixed thereto;

means for connecting said shaft of said first means to said shaft of said second means; and

means connected to said base for rotating said second means about said shaft thereof and for rotating said shaft of said first means within said first means via said connecting means.

4,520,356

DISPLAY VIDEO GENERATION SYSTEM FOR MODIFYING THE DISPLAY OF CHARACTER INFORMATION AS A FUNCTION OF VIDEO ATTRIBUTES

David B. O'Keefe, Westford, and Robert C. Miller, Braintree, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Continuation of Ser. No. 159,417, Jun. 16, 1980, abandoned. This application Aug. 20, 1982, Ser. No. 409,774

Int. Cl.³ G09G *1/00*

U.S. Cl. 340—750 **11 Claims**

1. A video character generation system in a display controller for producing a video signal to be used by a display monitor to produce video information on a display screen of said display monitor in response to a plurality of information words stored in a refresh memory of said display controller, wherein said display controller includes raster scan logic having a column counter for producing a character clocking signal and a line counter for producing a line count indicative of the scan line being refreshed on said display screen, said video character generation system comprising:

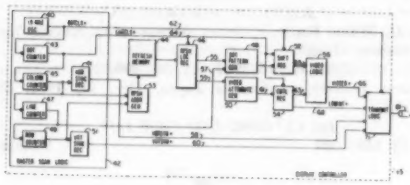
a. a character dot pattern generation means, coupled to said refresh memory, for producing a serial dot pattern signal

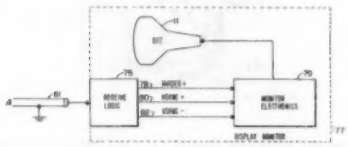
corresponding to a raster scan line of one character of said video information in response to a unit of encoded character information contained in each of said plurality of information words retrieved from said refresh memory and said line count from said line counter;

b. an attribute generation means, coupled to said refresh memory, for receiving a plurality of attribute signals encoded in each of said plurality of information words, said plurality of attribute signals for controlling how one or more associated characters of video information is to be displayed on said display screen, said attribute generation means for generating a plurality of video control signals;

c. a control register for storing said plurality of video control signals, said control register being clocked by said character clocking signal; and

d. video logic for combining said serial dot pattern signal with some of said video control signals from said control register to produce said video signal for each of said plurality of information words.





4,520,357

ELECTROSCOPIC INFORMATION DISPLAY AND ENTRY SYSTEM WITH WRITING STYLUS

Donald E. Castleberry, Schenectady, and Charles A. Becker, Rexford, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jul. 23, 1982, Ser. No. 401,191
Int. Cl.³ G09G *3/34*
U.S. Cl. 340—783 **7 Claims**

1. An information display and energy system, comprising:

an electroscopic display having a multiplicity of individually-actuatable display cells arranged in a matrix, each cell including a flat plate electrode of magnetically-attractable material and moveable between first and second positions substantially parallel, and with respect, to a fixed planar electrode to provide first and second respective display conditions;

means for actuating the plate electrode of each individual one of said cells between said first and second display positions responsive to display data;

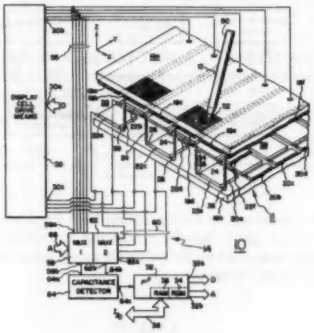
means connectable between the cell plate electrode and the associated fixed electrode of an individual one of said display cells for measuring a change in the capacitance between the plate and fixed electrodes of said cell;

means for sequentially connecting said measuring means to each of the cells of said display;

a magnetic member completely external to said display and manually positionable adjacent to a selected cell to cause movement only of the plate electrode of that selected cell only from the first position to the second position;

means for storing the display data determining the state of each display cell; and

means connected to said storing means and separately connected to both said connecting means and said measuring means for determining, by comparison of matrix location data for each display cell with a relatively large total capacitance with the display data in said storing means, which of said cells, if any, has been acted upon by said external magnetic member to cause the total cell capacitance to increase responsive to data input to said system.

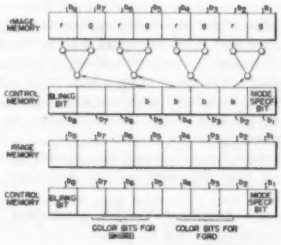


4,520,358

OPTIMIZED DISPLAY DEVICE MEMORY UTILIZATION

Tomoaki Makino, Fujisawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 11, 1982, Ser. No. 377,243
Claims priority, application Japan, May 20, 1981, 56-76065
Int. Cl.³ G09G *1/28*
U.S. Cl. 340—799 **2 Claims**



1. In a display indicating system having a memory device including a parallel combination of an image memory and a control memory and further including a decoder which is connected to said parallel combination of said image and control memory, a method of utilizing said memory device to selectively store both color images and characters comprising the steps of:

for a pixel of a color image, storing color information in a selected address in said image memory and in selected portions of a selected address in said control memory;

for a pixel of a character, storing dot brilliance information in a selected address in said image memory;

storing a mode specifying bit in a selected portion of a selected address in said control memory, said mode specify-

ing bit being indicative of whether its corresponding pixel is part of a color image or characters;

for a pixel of a character, storing color information in selected portions of a selected address in said control memory;

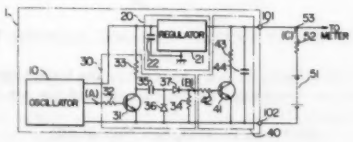
reading out data stored in a selected address in both said image and control memories and feeding said data to said decoder, said decoder decoding said data into red and green and blue data for feeding a display of said systems in accordance with the state of the mode specifying bit, wherein, for a fixed word size at a selected address in said image and control memories, said display displays a preset degree of color resolution for a color image and a preset degree of brilliance resolution for a character and further enables a variable dot resolution within a single picture displayed by said display.

4,520,359

CURRENT FREQUENCY WAVEFORM TRANSMITTING ON D.C. POWER LINES

Junji Kitagawa; Shigeyuki Akita, both of Okazaki, and Sotoo Kitamura, Aichi, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Jun. 9, 1982, Ser. No. 386,511
Claims priority, application Japan, Jun. 12, 1981, 56-86994[U]
Int. Cl.³ G08C *19/16, 19/20, 19/12*
U.S. Cl. 340—870.19 **3 Claims**



1. A frequency transmission system for transmitting a frequency signal, comprising:

a d.c. battery;

a pair of power supply lines connected to said d.c. battery;

an oscillator connected to said battery through said power supply lines for generating a first train of pulse signals having a varying frequency;

a pulse generator for generating a second train of pulse signals in synchronism with said first train of pulse signals, each of said second train of pulse signals having a pulse duration shorter than that of each of said first train of pulse signals;

a switching element connected across said power supply lines for varying an electric current flowing through said power supply lines in synchronism with said second train of pulses; and

a capacitor connected across said power supply lines in parallel relation to said switching element for blunting variations in said electric current.

4,520,360

SENSING VERTICAL AND HORIZONTAL VISIBILITY

Carl E. Schwab, Huntington Station, N.Y., assignor to General Signal Corporation, Stamford, Conn.

Filed Sep. 20, 1982, Ser. No. 419,885
Int. Cl.³ G08G *5/00*
U.S. Cl. 340—947 **14 Claims**

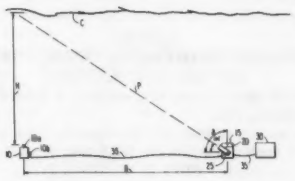
1. An information sensing device particularly suited for unattended airports for sensing vertical and horizontal visibility, comprising:

a light source emitting optical energy in at least two directions,

a light detector spaced from said light source by a distance B, in a generally horizontal direction,

means rotating said light detector about a generally horizontal axis for altering a field of view of said light detector as a function of time, and

control means responsive to said light detector for determining horizontal visibility and vertical visibility by sampling a response of said light detector to said light source at different times and fields of view and producing representations thereof.

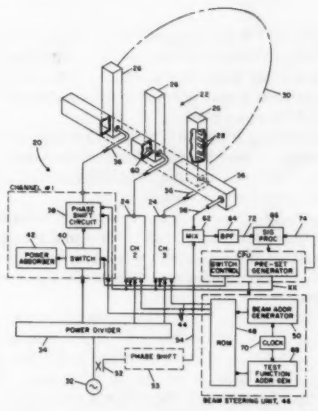


4,520,361

CALIBRATION OF A SYSTEM HAVING PLURAL SIGNAL-CARRYING CHANNELS

Richard F. Frazita, St. James, N.Y., assignor to Hazeltine Corporation, Commack, N.Y.

Filed May 23, 1983, Ser. No. 497,348
Int. Cl.³ G01R *17/04;* **G01S** *7/40*
U.S. Cl. 343—372 **26 Claims**



1. A method for calibrating phase-shifts in a system having multiple signal-carrying channels comprising the steps of:

terminating the propagation of signals in each of the channels except for a selected channel which is to be calibrated;

inserting a test signal into a first end of said selected channel;

extracting a portion of said test signal prior to said inserting for use as a reference signal;

imparting a variable phase-shift between said reference signal and said test signal by phase-shifting apparatus responsive to a command signal, said command signal directing a monotonic continuing pattern of phase variation, the resulting variation in phase producing a frequency shift between said test signal and said reference signal;

sampling said test signal after processing through the selected channel via a second end of said selected channel;

combining the sampled test signal with the reference signal to obtain a beat frequency signal;

measuring the phase-shift between said beat frequency signal and a reference pattern signal; and

adjusting the starting phase-shift of the selected channel in response to the measured phase-shift.

4,520,362

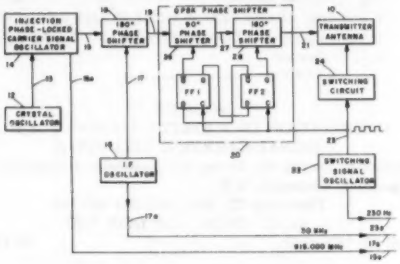
POLARIZATION RATIOMETRY OBJECT DETECTION SYSTEM AND METHOD

Lincoln H. Charlot, Tampa, Fla., assignor to Elint Corporation, St. Petersburg, Fla.

Continuation of Ser. No. 140,868, Apr. 16, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 428,547

Int. Cl.³ G01S *13/00*; H04B *7/10*

U.S. Cl. 343—361 **8 Claims**



1. A method for detecting objects having preferential polarization plane reflection characteristics, comprising the steps of:

(a) transmitting from a first given location, a first plane-polarized electromagnetic wave that is oriented in a predetermined reference plane;

(b) transmitting from the first given location, a second electromagnetic wave having the same frequency and intensity as the first wave and not being oriented in the predetermined reference plane;

(c) receiving at a second given location, reflections of the first transmitted wave to provide a first received signal;

(d) receiving at the second given location, reflections of the second transmitted wave to provide a second received signal;

(e) comparing the first received signal to the second received signal for detecting an object that preferentially reflects said transmitted electromagnetic waves in a distinct plane so as to distinguish such object from other objects not having such characteristics;

(f) shifting the phase of the first electromagnetic wave;

(g) shifting the phase of the second electromagnetic wave to be in phase with the first electromagnetic wave; and

(h) periodically varying the degree of said phase shift of the first and second waves to avoid consistent multipath wave cancellations and reinforcements.

4,520,363

OMNIDIRECTIONAL VERTICAL ANTENNA WITH IMPROVED HIGH-ANGLE COVERAGE

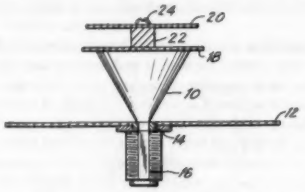
Melvin H. Wachspress, Syosset, and Walter Abramowitz, Jamaica, both of N.Y., assignors to General Instrument Corporation, New York, N.Y.

Filed Mar. 16, 1983, Ser. No. 475,921

Int. Cl.³ H01Q *1/36*

U.S. Cl. 343—828 **5 Claims**

1. An antenna structure comprising an inverted conical monopole, a ground plane secured to one end of said monopole, a first conducting plate having a diameter greater than that of the largest diameter of said monopole secured to the other end of said monopole, a second conducting plate, and a



spacer interposed between and secured to said first and second plates and axially aligned therewith and with said monopole.

4,520,364

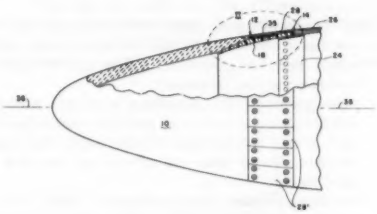
ATTACHMENT METHOD-CERAMIC RADOME TO METAL BODY

John S. Perry, Seattle, Wash., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1983, Ser. No. 486,603

Int. Cl.³ H01Q *1/28*, *1/42*

U.S. Cl. 343—872 **6 Claims**



1. A radome assembly comprising a conical ceramic shell, a polymeric transition section, a layer of insulating material and a metal fairing adapted for mounting on a substantially cylindrical supporting structure, said supporting structure having an outer diameter and a support flange for receiving said assembly, said flange having a lesser outer diameter;

wherein said conical ceramic shell has a base edge and an inner face adapted for joining to said transition section;

wherein said transition section has a first end portion, an aft portion and a middle portion therebetween, said first end portion having an outer surface complementary to said inner face of said shell, said middle portion having a circumferential recess in the outer surface thereof for receiving therein a layer of said insulating material, and said aft portion having an inside diameter adapted for mounting over said support flange; and

wherein said metal fairing circumferentially surrounds said transition section including said layer of insulating material, between said supporting structure and said base edge of said ceramic shell.

4,520,365
TELESCOPING ANTENNA WITH ACTUATING GEAR DRIVEN CABLE

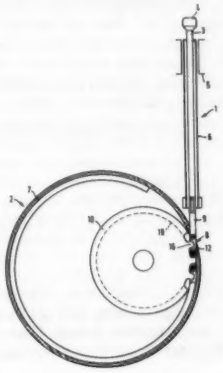
Richard Langheck, Neubärental, Fed. Rep. of Germany, assignor to Wilhelm Sihn Jr. KG., Niefern-Oschelbronn, Fed. Rep. of Germany

Filed Dec. 29, 1982, Ser. No. 454,342

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1982, 3200444

Int. Cl.³ H01Q *1/10, 1/32*

U.S. Cl. 343—903 **7 Claims**



1. Telescoping antenna with actuating device for motor vehicles, extendable and retractable by means of a long flexible element which runs inside the telescope and is fitted with apertures spaced in longitudinal direction at regular intervals behind one another, which mesh with the teeth of a driven toothed gear, characterized in that the flexible element is a plastic wire with a nearly round cross-section, wherein the apertures are slots which are interspersed along the wire along a plane containing a longitudinal center line of the extended wire, each slot having a pair of spaced opposed parallel areas and a pair of angular surfaces terminating in spaced opposed cusps which lie along said longitudinal center line, the spacing L between the opposed cusps increases from the longitudinal center line, along said angular surfaces, towards the wire surface.

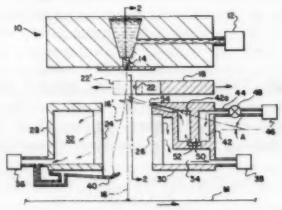
4,520,366
METHOD AND APPARATUS FOR AIR START/STOP OF AN INK JET PRINTING DEVICE

Glynn P. Cragin, Jr., Irving, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed Jan. 9, 1984, Ser. No. 569,138

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **27 Claims**



1. A method of starting and stopping the flow of ink from an ink jet printer on to a printing media from a plurality of ink jet orifices through which streams of droplets of ink continuously issue and having charge electrodes, deflection electrodes and a drop catcher, the steps comprising:

(a) starting up the flow of ink on to said media by

(i) directing a flow of air across the orifices transverse to the normal direction of issuance of said droplets from said orifices,

(ii) applying a deflection voltage to the deflection electrodes,

(iii) initiating the flow of ink from said orifices,

(iv) applying a charge voltage to the charge electrodes,

(v) directing all of the issued droplets from said orifices into said catcher by use of said air flow,

(vi) terminating said air flow to begin normal printing operation on said media;

(b) stopping the flow of ink on to said media by

(i) directing a flow of air across the orifices transverse to the normal direction of issuance of droplets from said orifices so as to cause all of said droplets to be caught by said catcher,

(ii) stopping the flow of ink from said orifices,

(iii) turning the charge and deflection electrodes off,

(iv) turning the air off.

4,520,367
INK JET HEAD ASSEMBLY

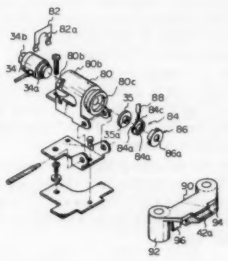
Chuji Ishikawa, Kawasaki; Kyuhachiro Iwasaki, Fujisawa; Masanori Horike, Tokyo, and Hiromichi Komai, Yokohama, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 9, 1984, Ser. No. 598,133

Claims priority, application Japan, Apr. 11, 1983, 58-63294

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—75 **7 Claims**



1. A mechanism for supporting a head, a charging electrode and a deflection electrode of an ink jet printer on a carriage, comprising:

first holder means having a front opening and a rear opening for detachably fixing the head and the charging electrode, the charging electrode being inserted into said first holder means through said front opening and the head being inserted into said first holder means through said rear opening; and

second holder means located in front of the first holder means for detachably fixing the deflection electrode;

the first holder means comprising a holder body having a first stepped portion with which an end portion of the head is engagable to fix the head in place and a second stepped portion for receiving the charging electrode to fix the charging electrode in place;

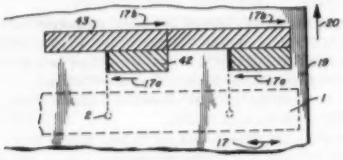
the first holder means further comprising spring means mounted in a rear portion of the holder body for biasing a rear end portion of the inserted head;

the spring means comprising a leaf spring formed with an opening for engagement with the head, the holder body comprising slots which are formed through a rear wall portion of the holder body to receive said leaf spring.

4,520,368
INK JET PRINTING METHOD AND APPARATUS

Dale R. Ims, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 10, 1983, Ser. No. 521,851
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **8 Claims**



6. An ink jet printer of the type having an elongated, oscillating printing bar with a plurality of nozzles linearly disposed therealong and having continuous streams of ink droplets expelled from the nozzles, the printed bar being adapted for printing across the full width of a recording medium which travels a single-pass straight-through path by the printing bar with a constant velocity, the ink jet printer comprising:

(a) means for supplying ink under pressure to the nozzles so that streams of ink injected therefrom;

(b) means for perturbing the ink streams to cause them to break up and form into droplets of a predetermined distance from the nozzles;

(c) means for charging the droplets at the point of formation by a controller;

(d) means for deflecting the charged droplets as they move towards the recording medium to direct them to a specific location on the recording medium or to a gutter for recirculation and reuse, the deflecting means being adapted to scan the droplets from each nozzle in the same direction as the movement of the recording medium and for a predetermined distance in that direction;

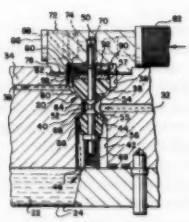
(e) means for oscillating the printing bar in a direction along its length and in a direction transverse to that of the path of travel by the recording medium, the distance of movement in one direction of oscillation or half cycle being that of spacing between nozzles; and

(f) means for adjusting the charge placed on the droplets by said charging means to compensate for the movement of the recording medium, so that the full width of said recording medium may be printed without overlapping and without voids.

4,520,369
AIR PILOTED VALVE FOR CONTROLLING START/STOP OF AN INK JET DROP GENERATOR

Craig R. Shackleton, Richardson, Tex., assignor to The Mead Corporation, Dayton, Ohio

Filed May 21, 1984, Ser. No. 612,525
Int. Cl.³ G01D *15/18*; F16K *31/128*
U.S. Cl. 346—75 **6 Claims**



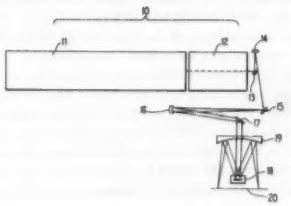
1. In an ink jet printing apparatus having an ink supply source connected to an ink reservoir from which ink is expelled for printing, the improvement comprising:

a housing defining an ink flow chamber, an inlet opening for admitting ink from said source to said chamber, an outlet opening for introducing ink to said reservoir from said chamber and a bypass opening for diverting ink from said chamber; first and second valve seats disposed on opposite sides of said chamber, said first seat disposed between said chamber and said bypass opening and said second seat disposed between said chamber and said outlet opening; a valve stem axially movably mounted in said housing and extending through said chamber and said first and second valve seats; spaced first and second sealing members fixedly mounted on said valve stem in spaced relation and separately engageable respectively with said first and second valve seats through movement of said stem; spring means engaging said stem for urging said second sealing member into engagement with said second seat to thereby seal off ink flow from said inlet opening to said outlet opening; air actuated diaphragm means engaging said stem for urging said first sealing member into engagement with said first valve seat upon actuation thereof to thereby seal off said inlet opening from said bypass opening.

4,520,370
LASER THERMAL PRINTER

Yoshihiko Fujii; Osamu Tomita, both of Osaka; Itaru Taniguchi, Motomachi, and Kazuhiko Saiwai, Osaka, all of Japan, assignors to Kanzaki Paper Manufacturing Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1983, Ser. No. 468,905
Claims priority, application Japan, Feb. 27, 1982, 57-30988
Int. Cl.³ G01G *13/02, 13/16*
U.S. Cl. 346—76 L **10 Claims**



1. A laser thermal printer comprising a CO_2 gas laser source,

a CdTe electro-optic modulator for the laser beam from said laser source,

an optical scanning system for scanning the laser beam, which is passed through said modulator, transversely of a predetermined recording surface while focusing it on said surface, and

a web feed mechanism for feeding a heat-sensitive recording web, which presents said recording surface, in a direction at right angles with the direction of said beam scanning.

4,520,371
MULTI-ZONE THERMAL PRINT HEAD

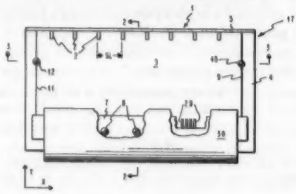
Rowland V. D. Firth, III; Willie Goff, Jr.; Ta C. Ku, all of Austin, and James M. Rakes, Leander, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1982, Ser. No. 454,917
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **14 Claims**

1. A heat applying print head in a thermal print apparatus for color transferring from a thermal ribbon onto a media, the head being arranged transverse (X) to the media transport

direction (Y) and comprising selectively controllable heating elements, said print head comprising:

a plurality of arrays of heating elements each one of said plurality of arrays forming a printing zone, said plurality of arrays thereby forming a plurality of printing zones, said plurality of arrays arranged on a substrate substantially parallel to the media transport direction (Y), each of said plurality of arrays of heating elements having a height (CH) at least equal to the height of one complete character



to be printed, said plurality of printing zones separated from each other a distance (SL) along a line (X) transverse to said media transport direction (Y); and,

means for moving said substrate back and forth over said predetermined distance (SL) in the direction (X) transverse to the media transport direction (Y), whereby one or more complete characters are printed along said line (X) during each movement of said substrate over said predetermined distance (SL).

4,520,372

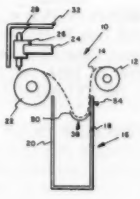
PLOTTER PAPER LOADING ASSIST APPARATUS

Dean-Yuan Liu, Canoga Park, Calif., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Oct. 4, 1983, Ser. No. 538,875

Int. Cl.³ G01D *15/28*

U.S. Cl. 346—136 **4 Claims**



1. In a graphics drum plotter having a vacuum column with front and rear walls disposed vertically between a paper supply roller adjacent and parallel to the rear wall and a drum adjacent and parallel to the front wall having a beam and writing head above and parallel thereto, the improvement for guiding strip paper from the supply roller across the vacuum column and to a point between the drum and beam/writing head during loading comprising:

(a) retractable guide means hingedly attached to the rear wall of the vacuum column adjacent the top thereof for movement between a first position wherein said guide means spans a portion of the space between the front and rear walls and a second position retracted from said first position to allow the paper to loop down into the vacuum column, said guide means being shaped for guiding paper rolling off the supply roller across the space between the front and rear walls of the vacuum column and for directing it into a position between the drum and the beam/writing head where it can be grasped; and,

(b) bias means for urging said guide means towards said first position with a force less than that exerted against it by paper being drawn into the vacuum column.

4,520,373

DROPLET GENERATING METHOD AND APPARATUS THEREFOR

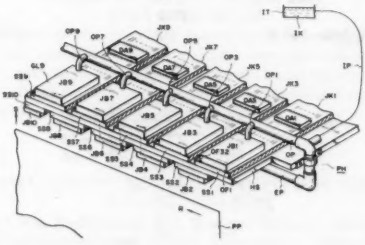
Naoki Ayata; Yoshiaki Shirato, both of Yokohama; Yasushi Takatori, Sagamihara, and Mitsuaki Seki, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 133,327, Mar. 24, 1980,. This application Mar. 3, 1983, Ser. No. 471,842

Claims priority, application Japan, Apr. 2, 1979, 54-39467; Apr. 2, 1979, 54-39468; Apr. 2, 1979, 54-39469; Apr. 2, 1979, 54-39470; Apr. 2, 1979, 54-39471; Apr. 11, 1979, 54-39472; Feb. 22, 1980, 55-21348

Int. Cl.³ G01D *15/16;* **H05B** *3/00*

U.S. Cl. 346—140 R **23 Claims**



1. A recording apparatus utilizing heating elements for thermal recording on a recording sheet, comprising:

a plurality of heating elements arranged with such a high density as to enable recording with a resolving power of at least 8 dots/mm;

a plurality of transistors divided into groups each containing at least 32 transistors for driving said heating elements;

at least 32 gates for driving said transistors;

a latch circuit of at least 32 bits;

a serial-in-parallel-out shift register of at least 32 bits for loading pixel signals into said latch circuit; and

input means for entering pixel signals into said shift register.

4,520,374

INK JET PRINTING APPARATUS

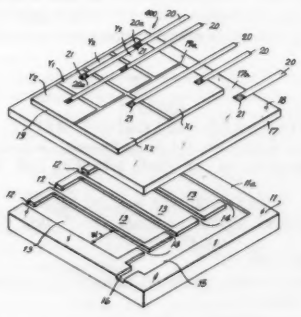
Haruhiko Koto, Shiojiri, Japan, assignor to Epson Corporation and Kabushiki Kaisha Suwa Seikosha, both of Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,191

Claims priority, application Japan, Oct. 7, 1981, 56-159896; Oct. 8, 1981, 56-160685; Oct. 8, 1981, 56-160686

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **31 Claims**



1. An ink jet printing apparatus for ejecting ink for printing comprising a plurality of nozzles and pressurization chambers

equal in number to the number of said nozzles, each nozzle being in fluid communication with a different one of said pressurization chambers, ink supply means for supplying ink to said pressurization chambers, each said pressurization chamber having first and second transducer means corresponding thereto for selectively deforming said pressurization chambers for ejecting ink out of said respective nozzles, and multiplex driver means for independently driving said first and second transducer means.

4,520,375

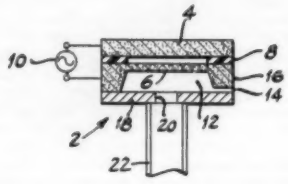
FLUID JET EJECTOR

John W. Kroll, Greendale, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed May 13, 1983, Ser. No. 494,246

Int. Cl.³ G01D *15/16*

U.S. Cl. 346—140 R **13 Claims**



1. A fluid jet ejector comprising a pair of spaced capacitor plates, one of which is a thin diaphragm of semiconductor material, responsive to a time varying voltage causing a varying electric field between said plates to set said diaphragm into mechanical motion, and reservoir means containing fluid contiguous said diaphragm and including a nozzle through which fluid exits responsive to said diaphragm motion.

4,520,376

HEAT-SENSITIVE RECORDING SHEET

Sadao Morishita, Ibaraki, and Toshihiko Matsushita, Funabashi, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Jul. 20, 1983, Ser. No. 515,528

Claims priority, application Japan, Jul. 22, 1982, 57-126730

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—204 **6 Claims**

1. A heat-sensitive recording sheet consisting of a support and a coating layer comprising microcapsules which are unbreakable when heated for heat-sensitive recording, said microcapsules each containing therein at least a colorless dye precursor as color former, a color developer and a waxy substance being solid at the normal temperature and melting when heated.

4,520,377

HEAT-SENSITIVE RECORDING MATERIALS

Ken Iwakura, Kanagawa, and Akira Igarashi, Shizuoka, both of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 7, 1983, Ser. No. 539,901

Claims priority, application Japan, Oct. 7, 1982, 57-176747

Int. Cl.³ B41M *5/18*

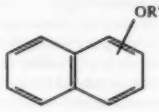
U.S. Cl. 346—208 **18 Claims**

1. A heat-sensitive recording material, comprising a substrate coated with:

an electron donating colorless dye;

an electron accepting compound;

a naphthol derivative represented by the general formula (V)



(V)

wherein R' represents an alkyl group, an aralkylene group, an aryl group, an alkylcarbonyl group, an arylcarbonyl group, an aryloxyalkylcarbonyl group, an alkylsulfonyl group or an arylsulfonyl group; and

at least one compound selected from the group consisting of urea derivatives containing 7 or more carbon atoms and a urethane derivatives containing 8 or more carbon atoms.

4,520,378

HEAT-SENSITIVE RECORDING PAPER AND A PROCESS FOR PRODUCTION THEREOF

Toshihiko Matsushita, Funabashi, and Sadao Morishita, Ibaraki, both of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,757

Claims priority, application Japan, May 21, 1983, 58-89641; May 21, 1983, 58-89642; May 21, 1983, 58-89643

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—209 **21 Claims**

1. A heat-sensitive recording paper comprising a support having provided thereon a heat-sensitive coated layer containing as main components two components of a normally colorless or light colored dye precursor and a color developer capable of forming a color when reacted with the dye precursor upon heating characterized in that at least one of the two components (the dye precursor and the color developer) is dispersed in an organic solvent inert to the two components and microencapsulated.

4,520,379

THERMALLY-RESPONSIVE RECORD MATERIAL

Kenneth D. Glanz, and Troy E. Hoover, both of Appleton, Wis., assignors to Appleton Papers Inc., Appleton, Wis.

Filed Jun. 15, 1984, Ser. No. 620,997

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—214 **12 Claims**

1. A thermally-responsive record material comprising a support member bearing a thermally-sensitive color-forming composition comprising chromogenic material and acidic developer material selected from the group consisting of allyl-4,4-bis(4-hydroxyphenyl)pentanoate and propargyl-4,4-bis(4-hydroxyphenyl)pentanoate in contiguous relationship, whereby the melting or sublimation of either material produces a change in color by reaction between the two, and a suitable binder therefor.

4,520,380

AMORPHOUS SEMICONDUCTORS EQUIVALENT TO CRYSTALLINE SEMICONDUCTORS

Stanford R. Ovshinsky, Bloomfield Hills, and Arun Madan, Birmingham, both of Mich., assignors to Sovonics Solar Systems, Solon, Ohio

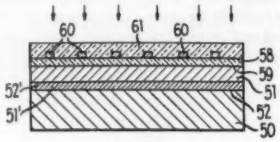
Continuation of Ser. No. 427,688, Sep. 29, 1982, Pat. No. 4,409,605, which is a continuation of Ser. No. 222,489, Jan. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 104,284, Dec. 17, 1979, abandoned, which is a division of Ser. No. 887,353, Mar. 16, 1978, Pat. No. 4,226,898. This application Oct. 7, 1983, Ser. No. 540,153

Int. Cl.³ H01L *45/00*

U.S. Cl. 357—2 **54 Claims**

1. A semiconductor film comprising a solid amorphous semiconductor host matrix including silicon and having electronic configurations which have an energy gap and a density

of localized defect states therein, said amorphous semiconductor host matrix including at least two compensating or alterant elements, wherein said compensating or alterant elements are incorporated in said amorphous semiconductor host matrix,



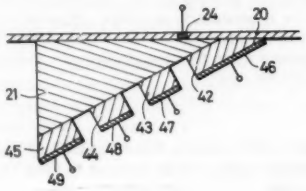
yielding an amorphous semiconductor material having electronic configurations with a reduced density of localized defect states in the energy gap, said density of states reducing elements being fluorine and hydrogen.

4,520,381

POLYCHROMATIC IMAGE SENSOR

Haruhiko Moriguchi, and Masami Kurata, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jan. 5, 1983, Ser. No. 455,635
Claims priority, application Japan, Jan. 13, 1982, 57-2684
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—30 **6 Claims**



1. A polychromatic semiconductor image sensor for converting an optical signal into an electrical signal comprising a light incident surface, a region of a first semiconductor type formed below said light incident surface and positioned away from the direction in which light becomes incident on said light incident surface, a plurality of second regions of a second semiconductor type adjoining said first region to define at least two PN-junctions with the depth of the PN-junctions from said light incident surface continuously varying, and output electrodes.

4,520,382

SEMICONDUCTOR INTEGRATED CIRCUIT WITH INVERSION PREVENTING ELECTRODE

Tastuo Shimura, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 17, 1981, Ser. No. 303,134
Claims priority, application Japan, Sep. 17, 1980, 55-127993
Int. Cl.³ H01L *29/40, 27/04, 27/12, 25/04*
U.S. Cl. 357—53 **32 Claims**

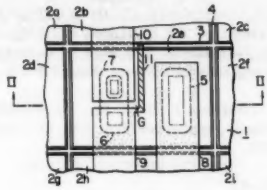
1. A semiconductor integrated circuit device comprising:

(a) a monolithic semiconductor chip including a plurality of island regions carried in a carrier region, each of said island regions being isolated from said carrier region and from other island regions by an associated island barrier;

(b) at least one of said island regions being of a first conductivity type and having at least two diffused regions of a second conductivity type opposite to said first conductivity type formed therein and isolated from each other;

(c) respective electrodes connected to said diffused regions with low resistance through an insulator film provided on said island region; and

(d) an inversion preventing electrode connected with one of said electrodes, and disposed relative to said island barrier



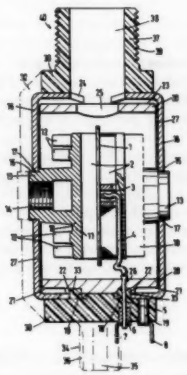
and said electrode so that said inversion preventing electrode, said island barrier and said one electrode enclose the associated diffused region to which said one electrode is formed from the other diffused region when viewed in the plane of said semiconductor chip.

4,520,383

POWER SEMICONDUCTOR COMPONENT FOR BOILING COOLING

Erwin Klein, Heddesheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Sep. 17, 1982, Ser. No. 419,831
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137407
Int. Cl.³ H01L *23/34, 23/46*
U.S. Cl. 357—81 **9 Claims**



1. Power semiconductor component for boiling cooling of a power semiconductor crystal disc having two main electrodes, comprising two multicontacts each being electrically connected to a respective one of the main electrodes for thermal and mechanical relief, two heat sinks each being in electrical and thermal contact with a respective one of said multicontacts, connecting eyes integral with said heat sinks for electrically connecting said main electrodes, a liquid and gas-tight housing surrounding the semiconductor crystal disc, said housing including a ceramic sleeve having a boiling liquid space formed therein and metallic covers disposed laterally on said ceramic sleeve, said connecting eyes protruding through and connected to said metallic covers, and an insulating sleeve molded around said housing, said insulating sleeve having at least one stub formed thereon having a hole formed therein for conducting an electrically-insulating refrigerant flow through said housing directly contacting the semiconductor disc, said

metallic covers having partially circular cutouts formed therein and said ceramic sleeve having a hole formed therein for said refrigerant flow.

4,520,384

POWER SEMICONDUCTOR COMPONENT FOR COOLING BY BOILING OR LIQUIDS

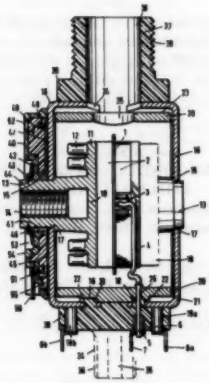
Erwin Klein, Heddesheim, Fed. Rep. of Germany, assignor to BBC Aktiengesellschaft Brown, Boveri & Cie., Baden, Switzerland

Filed Sep. 17, 1982, Ser. No. 419,398

Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137408

Int. Cl.³ H01L *23/34, 23/46*

U.S. Cl. 357—82 **11 Claims**



1. Power semiconductor component for boiling cooling or liquid cooling, comprising a semiconductor crystal disc having two main electrodes and, optionally, one or more control electrodes, a liquid and gas-tight housing through which an electrically insulating coolant can flow, the housing including a ceramic sleeve with metallic covers disposed on both sides thereof, the housing completely surrounding said disc and the metallic covers being acted upon by the coolant directly, and electric circuitry with high dissipation heat, especially resistors and diodes, integrated in a circuitry module (**40**) which is in force-locking thermal contact with the outside of the metallic cover (**16**) of the power semiconductor component for cooling.

4,520,385

TELEVISION TRANSMISSION SYSTEM

Richard N. Jackson, Horley, Great Britain, and Sing L. Tan, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

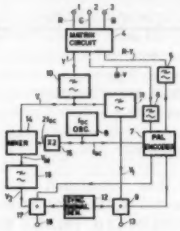
Filed Dec. 6, 1982, Ser. No. 447,083

Claims priority, application United Kingdom, Jun. 11, 1982, 8217099

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—12 **14 Claims**

1. A method of transmitting a high definition color television signal including a wide-band luminance information signal having lower, middle and upper frequency components, said method comprising the steps: forming a first luminance portion containing the lower frequency components of said luminance information signal; forming a second luminance portion containing the higher frequency components of said luminance information signal; transmitting said first luminance portion by way of a first transmission path; frequency shifting said second luminance portion such that the resulting frequency shifted second luminance portion lies within the bandwidth of a second transmission path, which band width is substantially equal to that of the first transmission path; and transmitting the frequency shifted second luminance portion by way of the second transmission path, characterized in that both said first and second luminance portions additionally contain the middle frequency components of said luminance information signal such that said middle frequency components are transmitted by both said first and second transmission paths; and said method further comprises transmitting a color subcarrier modulated by



color information by way of said first transmission path which modulated subcarrier is located substantially within the frequency spectrum occupied by said middle frequency components, whereby the transmissions from the first and second transmission paths may be received together and the first and second luminance portions of the luminance information recombined for re-production as a high definition color television display or the transmission from the first transmission path may be received alone for reproduction as a color television display of normal quality.

4,520,386

COLOR VIDEO SIGNAL PROCESSING APPARATUS

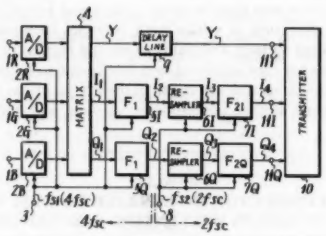
Takashi Asaida, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 25, 1982, Ser. No. 391,992

Claims priority, application Japan, Jun. 30, 1981, 56-101689

Int. Cl.³ H04N *9/32*

U.S. Cl. 358—13 **7 Claims**



1. A color video signal processing apparatus which is supplied with a luminance data signal and first and second color difference data signals which are digitized at a first sampling frequency and are formed by a matrix, characterized in that at least one of said first and second color difference data signals is sampled in a resampler at a second sampling frequency divided by an integer of said first sampling frequency, a digital filter for limiting the band width of the sampled output of said resampler to a predetermined band width, and said means combining said luminance data signal and said first and second color difference data signals whose band widths have been limited, wherein said color difference signal which is sampled at said second sampling frequency includes at least a Q signal component, wherein prior to being sampled at said second sampling fre-

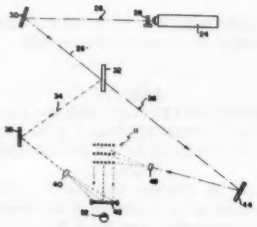
quency, a prefilter receives said color difference signal so as to prevent aliasing noise from being caused during the sampling operation.

4,520,387

HOLOGRAPHIC IMAGER

Conrad Cortellini, Indianapolis, Ind., assignor to Moorfeed Corporation, Indianapolis, Ind.

Filed Aug. 6, 1980, Ser. No. 175,654
Int. Cl.³ G03H *1/30*; H04N *9/54*
U.S. Cl. 358—90 **12 Claims**



1. A holographic imager, comprising

a holographic screen having a plurality of angularly multiplexed holograms, each hologram comprising a pixel array formed by making a hologram of a planar matrix of substantially identical objects;

a light source; and

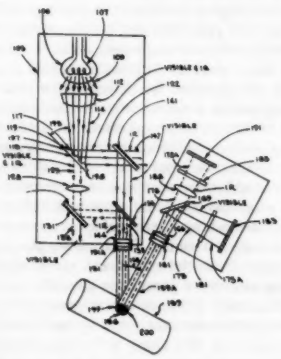
a modulator for receiving an image signal and modulating said light source to illuminate particular pixels of particular holograms of said holographic screen in response to the image signal.

4,520,388

OPTICAL SIGNAL PROJECTOR

Truman F. Kellie, West Chester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Nov. 1, 1982, Ser. No. 438,141
Int. Cl.³ G01B *11/00*; H04N *7/18*
U.S. Cl. 358—107 **22 Claims**



1. An optical projector comprising:

(a) means for providing light beams of different wavelengths from light provided by at least one light source and

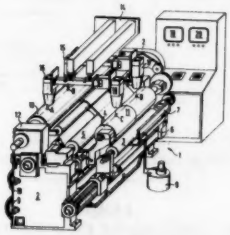
(b) means for projecting the light beams of different wavelengths to an object at substantially the same degree of focus and at substantially the same magnification.

4,520,389

METHOD OF MOUNTING PRINTING BLOCKS IN CORRECT POSITIONS ON FORM CYLINDERS OF FLEXOGRAPHIC PRINTING MACHINES FOR MULTICOLOR PRINTING

Manfred Horuschuh, Hilter, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Mar. 8, 1983, Ser. No. 473,277
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209484
Int. Cl.³ H04N *7/18, 7/00*
U.S. Cl. 358—107 **6 Claims**



1. A method of mounting a printing block on a form cylinder of a flexographic printing machine for multicolor printing in phase with a mounting pattern secured to a mounting cylinder, said method comprising:

converting into electronic signals an image of each of two spaced apart points located on the mounting pattern and of each of two spaced apart points located on the printing block mounted on the form cylinder, viewed from fixed and mutually corresponding locations relative to the mounting cylinder and relative to the form cylinder,

transmitting said electronic signals to a remote location,

reconverting said electronic signals into images at said remote location,

adjusting the location of the printing block on the form cylinder until the reconverted images of the corresponding points for each spaced apart point on the mounting pattern and on the printing block are in register, and

securing the printing block to the form cylinder at the adjusted location.

4,520,390

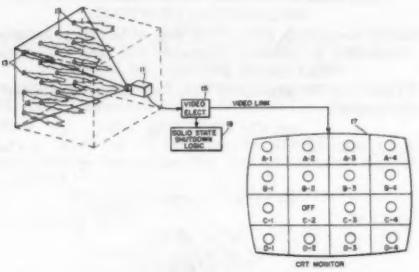
BURNER MONITORING SYSTEM

Candelario Paredes, Dallas, Tex., and William D. Stevens, North Caldwell, N.J., assignors to Forney Engineering Company, Carrollton, Tex.

Filed Aug. 25, 1982, Ser. No. 411,224
Int. Cl.³ H04H *7/18*
U.S. Cl. 358—108 **10 Claims**

1. A burner monitoring system comprising an array of burners, each of said burners when lit producing a flame with a hot spot having a characteristic brightness in alignment with such burner different than the brightness of the remainder of said flame and smaller than said flame, video camera means positioned to view said array of burners and generate a video signal representing an image of the lit ot unlit condition of each of said burners, means responsive to said video signal to determine whether a hot spot having said characteristic brightness is in alignment with each of said burners and generate a first predetermined signal indication for each of said burners to indicate that such burner is lit when a hot spot with said char-

acteristic brightness is present in aligment with such burner and a second predetermined signal indication to indicate that



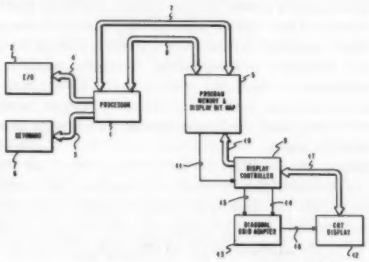
such burner is unlit when a hot spot with a said characteristic brightness is not present in alignment with such burner.

4,520,391

DIAGONAL GRID IMAGE COMMUNICATION AND DISPLAY

Albert D. Edgar, and Neil D. Lubart, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 20, 1982, Ser. No. 450,892
Int. Cl.³ H04N *3/00*
U.S. Cl. 358—133 **8 Claims**



1. A method of displaying image data on an image display device comprising:

converting the image data pels in the image to be displayed from a square grid matrix to a diagonal grid matrix; and

directly displaying said image data after conversion to a diagonal grid matrix on an image display device so that alternate columns or rows of pels in the displayed image are displaced from each other by one-half the distance between pels in the displayed image.

4,520,392

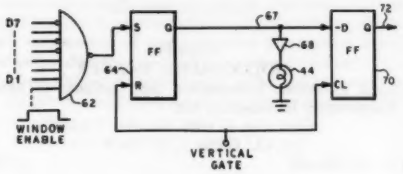
TELETEXT RECEPTION INDICATOR

Charles M. Cox, Buffalo Grove, and Charles Heuer, Glencoe, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Continuation-in-part of Ser. No. 323,530, Nov. 23, 1981, abandoned. This application Mar. 4, 1983, Ser. No. 471,978
Int. Cl.³ H04N *7/04*
U.S. Cl. 358—147 **7 Claims**

1. For use with a teletext decoder which decodes teletext signals having a framing code, a teletext indicator, comprising:

control means associated with the teletext decoder and responsive to the decoder's detection of a framing code for generating a control signal, said control means being responsive to vertical rate gate pulses for resetting the control signal; and



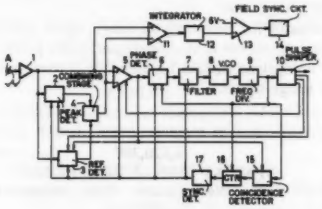
indicating means responsive to the control signal for indicating the receipt of a valid teletext signal.

4,520,393

SYNCHRONIZING CIRCUIT ARRANGEMENT FOR DERIVING AND PROCESSING A SYNCHRONIZING SIGNAL CONTAINED IN AN INCOMING VIDEO SIGNAL

Wilhelmus A. J. M. Zwijsen; Cornelis P. J. Duijndam, and Wouter Smeulers, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 29, 1982, Ser. No. 427,056
Claims priority, application Netherlands, Oct. 6, 1981, 8104533
Int. Cl.³ H04N *5/04*
U.S. Cl. 358—149 **16 Claims**



1. A synchronizing circuit arrangement for deriving and processing a synchronizing signal contained in an incoming composite video signal, the synchronizing signal comprising at least line and field synchronizing pulses whose amplitude extends between a reference and a peak level, the circuit arrangement comprising a peak level detector coupled to a signal input of the circuit arrangement for detecting the peak level of the synchronizing pulses, a reference level detector coupled to the signal input of the circuit arrangement for detecting the reference level of the synchronizing pulses, means coupled to said reference and said peak level detectors for determining a clipping level located between the peak and reference levels, a first comparator stage having a first input terminal coupled to the signal input, a second input terminal for receiving said clipping level, and an output terminal for applying the synchronizing signal separated from the composite video signal to a line synchronizing circuit for generating a locally generated signal of the line frequency, the circuit arrangement further comprising a synchronization detector stage for establishing a synchronized state in which the phase difference between the line synchronizing pulses in the synchronizing signal and pulses in the locally generated signal is less than a predetermined value and for changing the mode of operation of portions of the circuit arrangement, characterized in that the peak level detector is active only during the occurrence of first line frequency keying pulses applied thereto and is controlled by said synchronization detector stage whereby in the synchronized state, said peak level detector operates as a mean-value detector, and

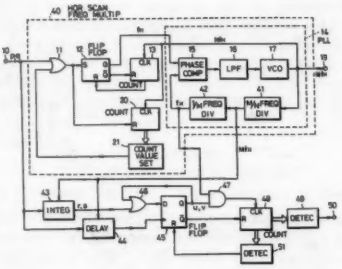
in a non-synchronized state, said peak level detector operates as a peak detector.

4,520,394

HORIZONTAL SCANNING FREQUENCY MULTIPLYING CIRCUIT

Kenji Kaneko, Iwai, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed May 2, 1983, Ser. No. 490,667
Claims priority, application Japan, May 6, 1982, 57-75784
Int. Cl.³ H04N *5/06, 7/04, 5/04*
U.S. Cl. 358—150 **5 Claims**



1. A horizontal scanning frequency multiplying circuit comprising:

a flip-flop supplied with an input horizontal synchronizing signal having a horizontal scanning frequency f_H of a television signal, which is set by this input horizontal synchronizing signal;

a phase-locked-loop comprising a voltage controlled oscillator for producing a signal having a frequency Nf_H which is N times the horizontal scanning frequency f_H, where N is an integer over one, a frequency divider for frequency-dividing an output signal frequency of said voltage controlled oscillator, and a phase comparator supplied with one output signal of said flip-flop and an output signal of said frequency divider, for comparing phases of these signals and applying an output error signal to said voltage controlled oscillator to control the oscillation frequency of said voltage controlled oscillator, said phase-locked-loop producing the signal having the frequency Nf_H through its voltage controlled oscillator;

a first counter supplied with and reset by the other output signal of said flip-flop, and supplied with the output signal of the voltage controlled oscillator within said phase-locked-loop as a clock signal, for producing a counted output every time the clock signal is counted for a predetermined counting time **T1** and supplying this counted output to said flip-flop to reset said flip-flop;

a second counter supplied with said input horizontal synchronizing signal and reset by said input horizontal synchronizing signal, and supplied with the output signal of the voltage controlled oscillator within said phase-locked-loop as a clock signal, for counting this clock signal;

counted value setting means for producing a high-level output according to an output of said second counter when said second counter counts for a predetermined counting time **T2**, where **T2>T1**; and

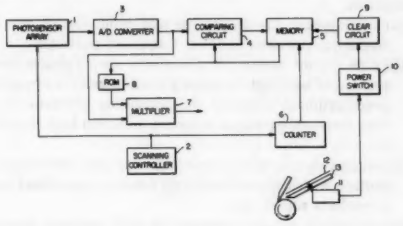
an OR-gate supplied with said input horizontal synchronizing signal and an output signal of said counted value setting means, for obtaining a logical sum of these signals supplied thereto, said OR-gate supplying its output to said flip-flop to set said flip-flop and supplying its output to said second counter to reset said second counter.

4,520,395

SYSTEM FOR CORRECTING SHADING OR NON-UNIFORMITY IN A PHOTOSENSITIVE ELEMENT ARRAY

Takahiko Abe, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jun. 9, 1983, Ser. No. 502,627
Claims priority, application Japan, Aug. 4, 1982, 57-136680
Int. Cl.³ H04N *5/14, 1/40*
U.S. Cl. 358—163 **7 Claims**



1. A system for correcting non-uniformities in the output of a photosensor system comprising:

an array of photosensitive elements for reading a pattern image on a document and for producing a series of output signals corresponding to said image;

a storage means, coupled to said array and having a number of memory cells each corresponding to a respective photosensitive element, for storing data representing the non-uniformity characteristics of the photosensor system;

a comparing means for successively comparing the signal from each element with the data stored in a corresponding memory cell and updating the data stored in said storage means in accordance with the results of said comparison; and

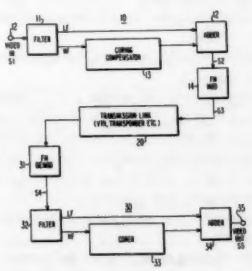
correcting means, coupled to the storage means and said photosensor array, for correcting the output signals of said photoelements by producing sensor output response signals that are compensated for said non-uniformities.

4,520,396

FM VIDEO TRANSMISSION SYSTEM HAVING CORING AND CORING COMPENSATION FOR REDUCING EFFECTS OF TRIANGULAR NOISE

Robert A. Dischert, Burlington, and Robert L. Libbey, Cherry Hill, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jul. 25, 1983, Ser. No. 517,028
Int. Cl.³ H04N *5/21;* **H04B** *1/10*
U.S. Cl. 358—167 **5 Claims**



1. In a transmission system of the type including input means for receiving an input signal to be transmitted, modulator means responsive to said input signal for imparting angle mod-

ulation to a carrier wave, a transmission path for coupling said angle modulated carrier wave to a receiver means, said receiver means including means for demodulating said carrier wave and for separating the demodulated carrier wave into high frequency and low frequency portions, means for coring said high frequency portion and means for adding the cored high frequency portion to said low frequency portion to form a output signal, the improvement for enhancing the signal-to-noise ratio of said cored high frequency portion of said demodulated carrier wave, characterized in that said input means comprises:

(a) filter means for separating said input signal into high frequency portions and low frequency portions;

(b) first circuit means for effectively amplifying a central portion of said high frequency portion and for imparting a predetermined offset to the remaining portions of said high frequency portion to form a modified high frequency portion;

(c) second circuit means for combining said low frequency portion with said modified high frequency portion to form a resultant signal; and

(d) modulator means responsive to said resultant signal for forming said angle modulated carrier wave.

4,520,397

AUTO BRIGHTNESS LIMITER CIRCUIT FOR TELEVISION

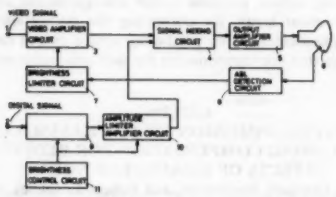
Hitoshi Hibi, Yaita, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1982, Ser. No. 450,475

Claims priority, application Japan, Nov. 11, 1982, 57-198420

Int. Cl.³ H04N *5/14, 5/68*

U.S. Cl. 358—168 **1 Claim**



1. An automatic brightness limiter circuit for use in a television receiver in which simultaneous display of broadcast signals and superimposed separate digital signals is made on a cathode ray tube comprising:

means for amplifying the broadcast signals supplied to said television receiver;

means for pulse amplifying the digital signals supplied to said television receiver;

means for amplitude limiting said digital signals;

means for mixing the broadcast signals amplified by the aforementioned means for amplifying broadcast signals and the digital signals amplitude limited by said means for amplitude limiting to develop a mixed signal;

means for supplying the cathode ray tube with the mixed signal obtained from said means for mixing to develop beam currents;

means for developing an automatic brightness limiter output when beam currents of said cathode ray tube exceed a prescribed value; and

means for controlling amplifier gain of said means for amplifying the video signals in response to said automatic brightness limiter output.

4,520,398

DIGITAL TELEVISION SPECIAL EFFECT WAVEFORM GENERATOR

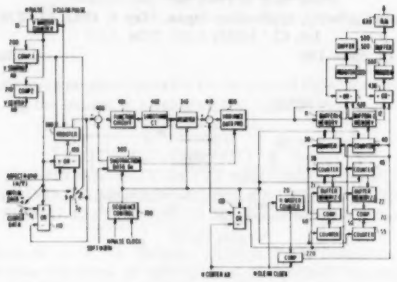
Hiroshi Takahashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Sep. 20, 1982, Ser. No. 420,215

Claims priority, application Japan, Sep. 18, 1981, 56-147393

Int. Cl.³ H04N *5/22, 9/535*

U.S. Cl. 358—183 **7 Claims**



1. A digital television special effect waveform generator for generating a gate signal used for composing two video signals through a special effect shape on a video screen having a plurality of scanning lines, comprising:

first producing means (**300**), responsive to position data with respect to said special effect shape, for producing basic data corresponding to each scanning line;

second producing means (**400**) responsive to said basic data for producing at least one subtracted basic data by subtracting a predetermined data from said basic data;

means (**401**) for converting said basic data and said at least one subtracted basic data into data indicating said special effect shape on a television screen, respectively; and

means (**600, 11, 30, 420, 320**) for generating an interpolated data sample between two adjacent data derived from said converting means so as to generate said gate signal.

4,520,399

PICTURE INFORMATION DISPLAY DEVICE

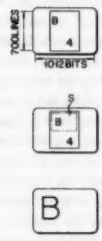
Kazuhiko Iida, Yokohama, Japan, assignor to Tokyo Shibaura Kenki Kabushiki Kaisha, Kawasaki, Japan

Filed Jan. 18, 1983, Ser. No. 458,877

Claims priority, application Japan, Jan. 29, 1982, 57-13166; Jan. 29, 1982, 57-13167

Int. Cl.³ H04N *1/04, 1/40*

U.S. Cl. 358—287 **9 Claims**



1. A picture information display device, comprising:

display means for displaying picture information;

scanning means for scanning the picture information on an original and detecting a size of the original;

control circuit means connected to said scanning means and having a page buffer memory, said control circuit means

being adapted to store the picture information in said page buffer memory, to determine a reductive ratio of the picture information read out from said page buffer memory in accordance with a relationship between a detected size of the original and a size of a display area, and to produce control signals;

size reduction circuit means connected to said control circuit means, for reducing, in accordance with the reductive ratio, a size of the picture information read out from said page buffer memory; and

display interface means connected to said size reduction circuit means and having a refresh memory for storing size-reduced picture information which corresponds to at least one page of the original, said display interface means being adapted to store the size-reduced picture information in said refresh memory, and to produce a display signal to said display means in accordance with a storage content of said refresh memory, whereby said display means displays with a constant size regardless of the original size the picture information which is produced by reducing the contents of said page buffer memory.

4,520,400

IMAGE RECORDING DEVICE

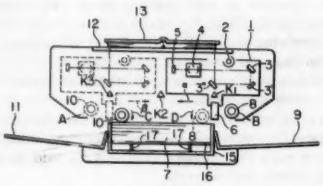
Noboru Koumura, Narashino, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,726

Claims priority, application Japan, Apr. 17, 1981, 56-58172; Dec. 22, 1981, 56-206144; Dec. 22, 1981, 56-206145

Int. Cl.³ H04N *1/22*

U.S. Cl. 358—296 **20 Claims**



1. An image recording device comprising:

means for housing a plurality of sheets of recording medium;

means for recording an image on a sheet of the recording medium while the sheet is housed in said housing means; and

means for exhausting from said housing means the recording medium which has been subjected to image recording by said recording means;

wherein said recording means performs recording during reciprocal movement relative to the recording medium.

4,520,401

DIGITAL VIDEO SIGNAL RECORDING SYSTEM AND REPRODUCING APPARATUS

Nobuaki Takahashi, Yamato; Seiichi Takashima, Ayase; Takeshi Shibamoto, Sagamihara; Fujio Suzuki, Machida; Koji Tanaka, Tokyo; Mitsuo Kubo, Yamato; Hiroyuki Sugiyama, Isehara; Yoshiaki Amano, Fujisawa, and Mitsuru Kikuchi, Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Apr. 14, 1983, Ser. No. 485,054

Claims priority, application Japan, Apr. 16, 1982, 57-63670; Apr. 22, 1982, 57-67817; Apr. 22, 1982, 57-67818; Apr. 22, 1982, 57-67820; Apr. 23, 1982, 57-68089; Apr. 26, 1982, 57-69785

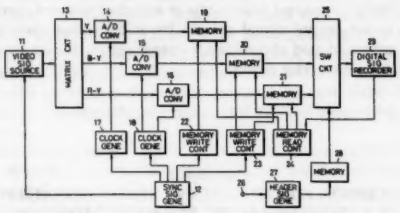
Int. Cl.³ H04N *5/76*

U.S. Cl. 358—310 **22 Claims**

1. A digital video signal recording system comprising:

first producing means for independently subjecting a luminance signal and two kinds of color difference signals of a color picture information to be recorded to digital pulse modulation, to produce a digital luminance signal and two kinds of digital color difference signals;

second producing means for dividing said digital luminance signal and said two kinds of digital color difference signals into picture element data groups, in terms of specific number of rows or specific number of columns which are adjacent on a screen, and adding a header signal at least comprising a synchronizing signal, a picture mode identification code, and a picture information quantity identification code to a beginning position of each of said divided picture element groups comprising said digital luminance signal and said two kinds of digital color difference signals, to produce a digital video signal having a signal format in which said digital luminance signal, said two kinds of digital color difference signals, and said header signal are time-sequentially multiplexed; and



recording means for recording said digital video signal onto a recording medium.

4,520,402

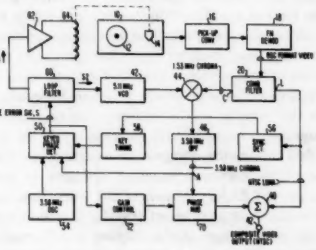
VIDEO APPARATUS WITH BURST LOCKED HETERODYNE CHROMA CONVERTER AND RESIDUAL TIME BASE ERROR CORRECTION

Robert N. Hurst, Jr., Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 15, 1982, Ser. No. 441,626

Int. Cl.³ H04N *9/44*

U.S. Cl. 358—324 **5 Claims**



1. In video apparatus of the type including a PLL heterodyne converter means for providing frequency translation and time base correction of the chrominance component of a composite video signal supplied to said converter means, said converter means including phase detector means for providing a phase error signal representative of a phase difference between a subcarrier reference frequency signal provided by a fixed frequency oscillator and the burst component of the converter chrominance output signal, said chrominance output signal tending to include residual time-base errors not corrected by said converter means, said apparatus including chrominance signal demodulator means having a first input terminal connected to receive said chrominance output signal, an output terminal for providing a demodulated chrominance output signal and a second input terminal for receiving said

subcarrier reference frequency signal, the improvement, comprising:

phase modulator means coupled to said fixed frequency oscillator for supplying said subcarrier reference frequency signal to said second input terminal of said demodulator means; and

circuit means coupled to said phase detector means for aplying said phase error signal to a modulation control terminal of said phase modulator means for imparting phase modulation to said subcarrier reference frequency signal to correct color shifts in said demodulated chrominance output signal caused by said residual time-base errors of said chrominance output signal of said heterodyne converter means.

4,520,403

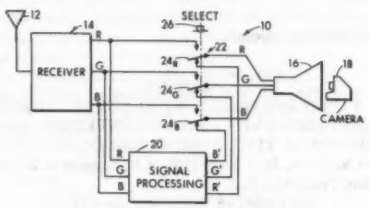
PROCESSOR FOR ENHANCING VIDEO SIGNALS FOR PHOTOGRAPHIC REPRODUCTION

James L. Burkhardt, Watertown, and John J. McCann, Belmont, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 360,468, Mar. 22, 1982.

Int. Cl.³ H04N *5/84, 5/92*

U.S. Cl. 358—332 **14 Claims**



1. A signal processor for use with a color television receiver of the type having a colored display screen, comprising:

circuit means for receiving the luminance components of color video signals from the color television receiver in order to impose a select transfer function to the received luminance component which function generally approximates the inverse of the transfer function of a selected photographic reproduction process so as to produce a modified luminance component which when transmitted to the color television receiver operates to produce an image on the display screen of the television receiver in accordance with said select transfer function such that a photographic image of the display screen made by said selected photographic process will substantially visually correspond to the video image which would otherwise be displayed on the display screen if the luminance component had not been modified by said circuit means;

network means for modifying the chrominance component of the color video signals so that the saturation of the imaged colors on the display screen is enhanced to at least partly compensate for a mismatch in the spectral emission properties of the display screen and the spectral sensitivities in the photosensitive layers of a photosensitive material selected for the photographic reproduction process; and

means for connecting said circuit means to receive said luminance component from the receiver and to transmit said modified luminance component back to the colored display source.

4,520,404

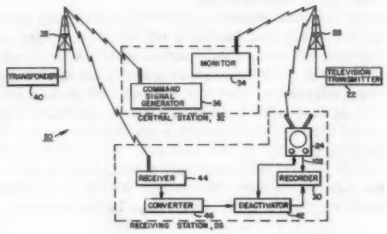
SYSTEM, APPARATUS AND METHOD FOR RECORDING AND EDITING BROADCAST TRANSMISSIONS

Henry Von Kohorn, 22 Perkins Rd., Greenwich, Conn. 06830

Filed Aug. 23, 1982, Ser. No. 410,464

Int. Cl.³ H04N *5/76*

U.S. Cl. 358—335 **34 Claims**



1. A remote editing system for broadcast transmissions comprising:

(a) monitoring system means for monitoring broadcast transmissions from a plurality of sources of such transmissions to determine the program content of each of said broadcast transmissions;

(b) means for signaling an editorial message based on said program content of individual ones of said broadcast transmissions;

(c) means coupled to said signaling means for transmitting said message to subscriber stations of said system;

(d) first receiving means in each of said subscriber stations for receiving said broadcast transmissions;

(e) second receiving means in each of said subscriber stations for receiving said message;

(f) means coupled between said first and said second receiving means for operating said first receiving means in accordance with the message received by said second receiving means; and wherein

(g) said operating means includes means responsive to said identity of a source for selectively controlling said first receiving means in accordance with a source selection.

4,520,405

INSERT RECORDING SYSTEM FOR A VIDEO SIGNAL

Akihiko Sasaki, Hiratsuka; Kouji Arai, Tokyo; Takano Takashi, and Yasuomi Namiki, both of Yokohama, all of Japan, assignors to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Jun. 18, 1982, Ser. No. 389,998

Claims priority, application Japan, Jun. 22, 1981, 56-96351; Jun. 22, 1981, 56-96352

Int. Cl.³ H04N *5/783*

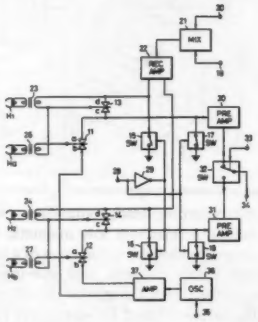
U.S. Cl. 360—10.3 **13 Claims**

1. An insert recording system for scanning over a magnetic tape which is pre-recorded with a video signal on tracks formed obliquely to the longitudinal direction of the magnetic tape having a track pitch TP, for erasing parts of the pre-recorded tracks, and for recording a different video signal on the erased parts of the pre-recorded tracks, said pre-recorded tracks being successively formed in contiguous contact with each other with essentially no guard band between two adjacent tracks by two video heads having gaps of mutually different azimuth angles, said insert recording system comprising:

first and second video head (H1, H2, 47*a*, 48*a*) mounted at mutually opposing positions on a rotary body so that lower ends of the first and second video heads lie on the same plane, said first and second video heads having gaps of mutually different azimuth angles and recording said different video signal with the track pitch TP on the erased parts of the pre-recorded tracks;

a single flying erase head (H_c) mounted at a position on the rotary body leading said first video head by θ radians in a rotating direction of the rotary body so that a lower end of said flying erase head is higher than the lower end of said first video head by a distance h which is described by an equation $h=TP\ (\theta/\pi)$, said flying erase head having a track width which is two times the track widths of the first and second video heads and having a gap of the same azimuth angle as the gap of said second video head;

erasing current generating means (**36, 19**) for generating an erasing current;



first control means (**11, 12, 35, 41, 44, 51, 54, 56, 57, 58,** C_3, R_2, D_3, **61**) for controlling supply of said erasing current to said flying erase head; and

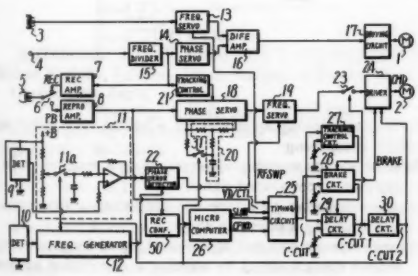
second control means (**13–16, 42, 43 52,** D_1, D_2, C_2, **55, 58, 59,** C_4, C_5, D_4, D_5, R_3, R_4, **60, 62**) for controlling supply of said different video signal to said first and second video heads, so that said first and second video heads successively record said different video signal without a guard-band on the erased parts of the pre-recorded tracks erased by said flying erase head.

4,520,406

VIDEO TAPE RECORDER WITH RECORD REVIEW MODE FOR EDITING SIGNALS RECORDED ON MAGNETIC TAPE

Toshinori Suzuki, c/o Sony Corporation, 7-35 Kitashinagawa 6-chome, Shinagawa-ku, Tokyo, and Minoru Ozawa, c/o Aiwa Co., Ltd., 209, Kandasuda-cho, Chiyoda-ku, Tokyo, both of Japan

Filed Mar. 24, 1982, Ser. No. 361,149
Claims priority, application Japan, Mar. 25, 1981, 56-43581
Int. Cl.³ H04N *5/782*
U.S. Cl. 360—14.2 **6 Claims**



1. A method for controlling advancement of tape in forward or reverse direction in a video tape recorder for use in editing information signals recorded on the tape, including a tape drive for advancing a tape in a forward direction and a reverse direction, said video tape recorder having a record mode in which an information signal including control signals is recorded on said tape such that the tape has said control signals recorded thereon at regularly spaced intervals along a longitudinal track, a playback mode, and an edit mode in which a second information signal may be recorded on said tape beginning at a selected edit point to follow a first information signal, and further having a pause mode wherein, when said video tape recorder enters said pause mode at a selected edit point on said tape, said tape drive means advances said tape in said reverse direction by a first length corresponding to a first predetermined number of said control signals, so that a portion of said first information signal recorded immediately preceding said edit point may be monitored prior to said video tape recorder entering said edit mode, said method comprising the steps of:

entering said pause mode to advance said tape in said reverse direction by said first predetermined number of control signals,

advancing said tape in said reverse direction by a second length corresponding to a second predetermined number of said control signals,

advancing said tape in said forward direction in said playback mode by a length of the tape substantially corresponding to the total of said first and second predetermined numbers of said control signals, and

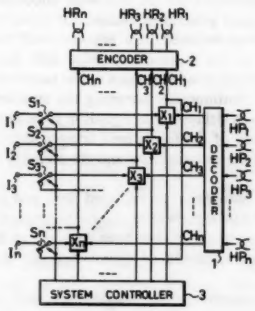
reentering said pause mode for further reversing said tape by said first length corresponding to said first predetermined number of control signals after the finish of said forwarding operation.

4,520,407

RECORDING AND/OR REPRODUCING APPARATUS FOR A MULTI-CHANNEL DIGITAL SIGNAL

Masato Tanaka, Tokyo, and Takenori Sonoda, Zama, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 10, 1983, Ser. No. 465,464
Claims priority, application Japan, Feb. 13, 1982, 57-21895
Int. Cl.³ G11B *5/00, 27/02*
U.S. Cl. 360—32 **11 Claims**



1. An apparatus for recording and/or reproducing a digital signal made up of a plurality of channel signals digitally recorded in respective tracks on a magnetic record medium, said apparatus comprising:

reproducing means for reproducing said channel signals recorded in said respective tracks;

recording means associated with said tracks for recording digital signals in said tracks; and

selector means for selectively supplying the reproduced channel signals to said recording means for digital recording by the latter in at least a selected one of said tracks on said magnetic record medium, said selector means includ-

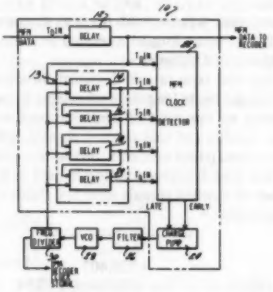
ing fader means with a fader element associated with each of said channel signals and having first and second input terminals and an output terminal, means connected to said reproducing means for supplying an associated reproduced channel signal to said first input terminal, and means for connecting said second input terminal to said output terminal of said fader element associated with another channel signal.

4,520,408

CLOCK SIGNAL SYNCHRONIZATION APPARATUS AND METHOD FOR DECODING SELF-CLOCKING ENCODED DATA

Juan F. Velasquez, Saline, Mich., assignor to VSP Labs, Inc., Ann Arbor, Mich.

Filed Feb. 22, 1983, Ser. No. 468,645
Int. Cl.³ G11B 5/09
U.S. Cl. 360—51 **8 Claims**



1. An apparatus for synchronizing a clock signal generating means with self-clocking encoded data output from a moving storage medium comprising:

means for receiving the self-clocking encoded data from the storage medium;

means, responsive to the received encoded data and the clock signal generating means, for generating a plurality of separate delayed data signals, each identical in frequency to the received encoded data but progressively delayed in time with respect to the received encoded data;

means for continuously sampling the encoded data and the plurality of delayed data signals in parallel to detect one of a plurality of predetermined trigger sequences of binary states of the encoded data and the plurality of delayed data signals;

means for sampling the encoded data and the plurality of delayed data signals after one of the predetermined trigger sequences of signals has been detected to detect a correct following sequence of signals for the detected trigger signal;

means for sampling the encoded data and the plurality of delayed data signals after one of the predetermined trigger codes has been detected to detect one of a third and fourth sequence of binary states of the encoded data and the plurality of delayed data signals, the third and fourth sequences of signals corresponding to a delayed or advanced clock rate of the clock signal generating means with respect to the self-clocking encoded data for each detected trigger sequence; and

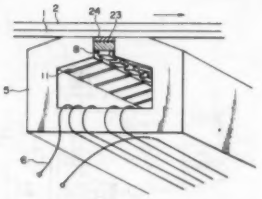
means for synchronizing the clock signal generating means with respect to the self-clocking encoded data in proportion to the amount of time between the occurrence of one of the third and fourth binary sequences and the occurrence of the second sequence of binary codes after one of the trigger sequences has been detected.

4,520,409

THERMAL AND MAGNETIC RECORDING HEAD

Toshifumi Kimoto; Teruhiko Itami; Nobuo Nishimura, and Koichi Saitoh, all of Kanagawa, Japan, assignors to Fuji Xerox Corporation, Limited, Tokyo, Japan

Filed Jul. 8, 1982, Ser. No. 396,504
Claims priority, application Japan, Jul. 10, 1981, 56-106966; Jul. 10, 1981, 56-106967; Jul. 20, 1981, 56-113280
Int. Cl.³ G11B 5/02
U.S. Cl. 360—59 **10 Claims**



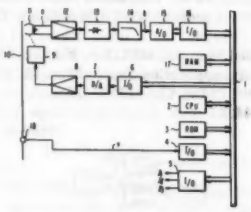
1. A magnetic recording head, comprising: a high permeability element having a relatively low magnetic transformation point; a non-magnetic element in the form of a layer formed on said high permeability element, said non-magnetic element being in close contact with a magnetic recording medium; and heat generating means divided for selectively applying a voltage to said high permeability element to thereby heat the latter, said high permeability element, non-magnetic element and heat generating means being provided in an air gap formed in a magnetic head core; said heat generating means comprising an array of selectively energizable resistors collectively forming a thermal head.

4,520,410

SCAN TRACKING APPARATUS FOR HELICAL SCAN VIDEO TAPE RECORDER

Toru Sekiguchi, and Isao Sanguu, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 28, 1983, Ser. No. 470,667
Claims priority, application Japan, Feb. 26, 1982, 57-30314
Int. Cl.³ G11B 5/58
U.S. Cl. 360—77 **3 Claims**



1. A scan tracking apparatus for a helical scan video tape recorder comprising:

head means for scanning video tracks on a magnetic tape to produce a reproduced signal;

means responsive to a tape for producing a first control signal having a sawtooth shape;

means responsive to said reproduced signal for producing a second control signal by utilizing a correlation between reproduced signals delivered from the previously scanned tracks; and

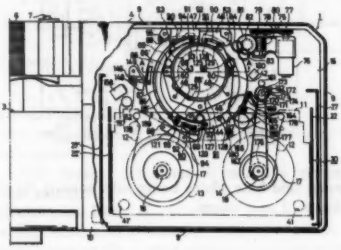
means responsive to said first and second control signals for deflecting said head means.

4,520,411

MAGNETIC TAPE RECORDING DEVICE

Eiji Ohshima, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,727
Claims priority, application Japan, May 25, 1983, 58-92037
Int. Cl.[3] G11B *15/66, 15/60*
U.S. Cl. 360—85 5 Claims



1. A magnetic tape loading device comprising a head drum having magnetic heads, a drum base supporting said head drum, a chassis, two loading rings supported on an upper surface of said chassis and rotatable in opposite directions, two tape guide blocks having guide posts for pulling out a magnetic tape from a tape cassette and winding it on said head drum, and guide block guide members for guiding one of said two tape guide blocks, said two loading rings being vertically spaced in coaxial relation at the outside of said drum base, said one of said two tape guide blocks being supported on said guide block guide members to be movable along a path slanted with respect to said two loading rings and being coupled to the lower loading ring by a connector mechanism, and the other of said tape guide blocks being coupled to the upper loading ring, so that said two tape guide blocks are movable in opposite directions around a periphery of said head drum in response to rotation of said two loading rings for winding said magnetic tape helically on said periphery of said head drum over an angle of contact with said head drum of at least 300° and with a spacing between the beginning and end of a portion of said magnetic tape that contacts said head drum corresponding substantially to the width of said magnetic tape.

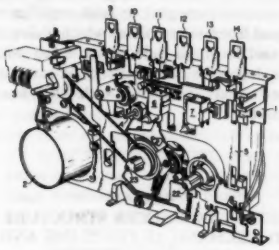
4,520,412

AUTOSTOP MECHANISM FOR TAPE RECORDER

Kobun Yoshida, Saitama, Japan, assignor to Pioneer Electronic Corporation, Japan

Filed Sep. 1, 1982, Ser. No. 413,659
Claims priority, application Japan, Sep. 2, 1981, 56-130483; Sep. 2, 1981, 56-130484
Int. Cl.[3] G11B *15/02, 17/02*
U.S. Cl. 360—96.1 14 Claims

1. An autostop mechanism for a tape recorder, comprising;
a reel arm fixed on a reel shaft of a take-up reel of said tape recorder so as to be rotatable therewith,
engagement means formed on said reel arm,
first means for engaging said reel arm engagement means, an autostop arm pivoted about a pivot point located at an intermediate portion of said autostop arm and means biasing said autostop arm in one direction,
second means for releasing a mode switching operation apparatus,



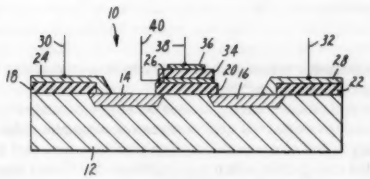
third means disposed between said first and second means, and provided with a cam mechanism for effecting said releasing operation.

4,520,413

INTEGRATED MAGNETOSTRICTIVE-PIEZOELECTRIC-METAL OXIDE SEMICONDUCTOR MAGNETIC PLAYBACK HEAD

Chester Piotrowski, White Bear Lake; Steven A. Bendson, Edina; Neil W. Loeding, Mounds View, and William M. Mularie, Grant Township, Washington County, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 13, 1982, Ser. No. 368,025
Int. Cl.[3] G11B *5/12, 5/30*
U.S. Cl. 360—113 16 Claims



1. A thin-film playback head for use with magnetic recording media comprising
(a) a semiconductive substrate having fabricated as an integral part thereof a solid state amplifier having contacts immovably secured thereto and to which appropriate electrical potentials and signals may be coupled,
(b) overlying said substrate, a thin-film of a magnetostrictive material and a thin-film of a piezoelectric material mechanically coupled to said magnetostrictive thin-film, wherein external magnetic fields induce strain in said magnetostrictive thin-film to in turn induce in said piezoelectric thin-film a corresponding electrical polarization and thereby result in a non-equilibrium charge density on at least one surface of said piezoelectric film which is directly proportional to the intensity of the external magnetic field, and
(c) at least two electrodes, each extending over at least a portion of a surface of said piezoelectric thin-film, for coupling an electrical potential corresponding to said charge density from said electrodes to said contacts of said amplifier,
whereby localized magnetic field patterns in a record track on a magnetic recording medium positoned adjacent said magnetostrictive thin-film may be directly sensed independently of the speed or changes in the speed at which the head is moved relative to the medium, as the stress induced in said

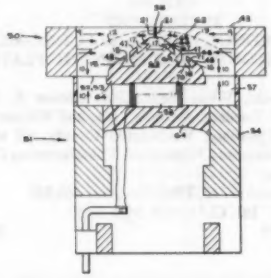
magnetostrictive thin-film due to such field patterns is coupled to said piezoelectric thin-film and resuls in said polarization and non-equilibrium charge density, and the corresponding potential coupled to said amplifier results in an output signal from said amplifier which is directly representative of said localized field patterns and which has low impedance, low noise characteristics, in contrast to the high impedance signal associated with the non-equilibrium charge density.

4,520,414

MAGNETIC TRANSDUCER STRUCTURE WITH IMPROVED MECHANICAL COUPLING AND METHOD OF MANUFACTURING

Stanley M. Latimer, San Jose, and Gregory A. Orton, Fremont, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Sep. 30, 1982, Ser. No. 429,909
Int. Cl.³ G11B *5/12*
U.S. Cl. 360—125 **47 Claims**



2. A magnetic transducer assembly having at least one transducing channel comprising:

each said channel having at least two separate magnetic core portions assembled with confronting magnetic poles abutting to define a transducing gap therebetween, said assembled core portions forming a substantially closed magnetic transducing circuit forming inner space;

at least two said separate magnetic core portions having respective keyways provided therein, said keyways forming recesses contiguous with said inner space; and

a nonmagnetic bond provided in at least a portion of said inner space including said recesses for joining said separate magnetic core portions together.

4,520,415

OPERATING LEVER APPARATUS

Minoru Kobayashi, and Shigeru Nemoto, both of Tokyo, Japan, assignors to Olympus Optical Co. Ltd., Tokyo, Japan

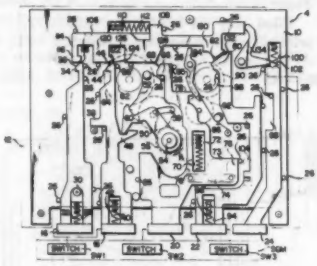
Filed Mar. 17, 1982, Ser. No. 359,121
Claims priority, application Japan, Mar. 30, 1981, 56-44767[U]; Mar. 30, 1981, 56-44768[U]; Mar. 30, 1981, 56-44769[U]; Mar. 30, 1981, 56-44771[U]
Int. Cl.³ G11B *15/18, 17/00, 15/48;* G05G *11/00*
U.S. Cl. 360—137 **18 Claims**

1. An operating lever apparatus, comprising:

a first base plate;

a second base plate separated from the first base plate in parallel therewith; and

a plurality of operating levers disposed between the first and second base plates and being slideably movable between respective first and second positions of said levers along and between said first and second base plates, the distance



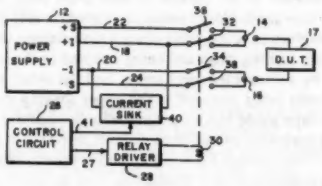
between said base plates being substantially equal to the thickness of said levers.

4,520,416

SHUNT-FOLDBACK VOLTAGE SOURCE

Karl Karash, Sudbury, Mass., assignor to GenRad, Inc., Concord, Mass.

Filed Mar. 1, 1984, Ser. No. 585,153
Int. Cl.³ H02H *7/22*
U.S. Cl. 361—11 **1 Claim**



1. A programmable power supply having an output terminal adapted for connection to a device under test, the programmable power supply comprising:

A. a foldback power supply, having an output port, for providing a predetermined output voltage at its output port until the current drawn by its load reaches a predetermined maximum, the foldback supply reducing both its output voltage and its output current when the predetermined maximum current is exceeded;

B. switch means connected between the output port and the output terminal and operable by application of control signals thereto selectively to complete and interrupt electrical connection between the output port and the output terminal;

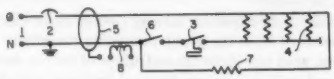
C. a shunt circuit connected in parallel with the power supply and operable by application of control signals thereto to tend to draw more than the predetermined maximum current from the current-limited power supply; and

D. a control circuit, connected for application of control signals to the switch means and the shunt circuit, for first applying signals to operate the shunt circuit to tend to draw more than the rated current from the foldback power supply to cause the supply voltage to drop to a low value and for then applying control signals to the switch means to open it to disconnect the foldback supply from any device under test connected to the output terminal.

4,520,417
ELECTRICAL MONITORING SYSTEMS

Louis M. Frank, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 14, 1983, Ser. No. 466,265
Int. Cl.³ H02H *3/33*
U.S. Cl. 361—45 **8 Claims**

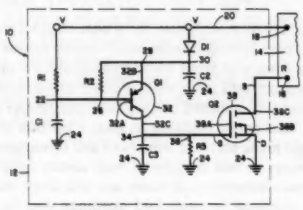


1. An electrical system which comprises
(i) a source of electrical power having a first and a second live terminal;
(ii) a circuit breaker connected to each live terminal of the power source;
(iii) an electrical load;
(iv) a first electrical connection means which is live and which connects the power source to the electrical load;
(v) a second electrical connection means which connects the power source to the electrical load;
(vi) an electrical switching device which has a low impedance when it is closed and a high impedance when it is open and which lies in the second electrical connection means; and
(vii) a ground fault indicator which signals a difference between the current flowing in the first connection means and the current flowing in the second connection means;
whereby the load is live when the circuit breaker is closed, both when the switching device is closed and when it is open, and the ground fault indicator will signal a leakage from the electrical load to ground both when the switching device is closed and when it is open.

4,520,418
RESET CIRCUIT

Roger E. Susi, 7006 E. 89th Pl., Tulsa, Okla. 74133

Filed Apr. 25, 1983, Ser. No. 488,213
Int. Cl.³ H02H *3/24*
U.S. Cl. 361—92 **4 Claims**

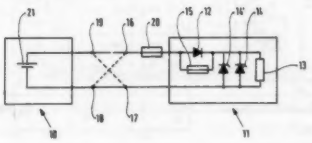


1. A reset circuit for monitoring the power supply voltage of a microprocessor, and for disabling the action of said microprocessor for a selected time period, at the times of power supply voltage change, such as at times of power on and power off of the microprocessor, comprising:
(a) a bridge network having four terminals, a first terminal A, a second terminal B, a third terminal C and a fourth terminal D, a first arm comprising a first diode D1 connected from terminal A to terminal B, a second arm comprising a first capacitor C2 connected from terminal B to terminal C, a third arm comprising a second capacitor C1 connected from terminal C to terminal D, and a fourth arm comprising a first resistor connected from terminal A to terminal D;
(b) a power supply with voltage terminal V connected to terminal A and a ground terminal connected to terminal C;
(c) the output terminals of said bridge are terminals B and D, with a load resistance R2 connected between them;
(d) amplifier means connected across the output terminals B and D, said amplifier means having no direct connection to said power supply and receiving operating power only from said bridge when said bridge is unbalanced;
(e) a reset terminal; and
(f) an electronic switch means controlled by said amplifier means and being connected to said reset terminal, the switch means supplying a high voltage which serves as a reset voltage, when said amplifier means is turned off.

4,520,419
POLARITY AND OVERLOAD PROTECTIVE CIRCUIT FOR ELECTRIC CONSUMERS

Johannes Locher, Stuttgart, and Wolfgang Schmidt, Vaihingen/-Enz, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 12, 1983, Ser. No. 522,844
Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231143
Int. Cl.³ H02H *3/18, 3/20*
U.S. Cl. 361—104 **8 Claims**



1. A polarity and overload protecting circuit for use in connection with an electric current consumer operating at a prescribed operational voltage and having at least two power supply conduits, the circuit comprising a fuse connected in series with one power supply conduit, a zener diode bridging the two power supply conduits and having its breakdown voltage adjusted to the prescribed operational voltage of the consumer, and a diode connected parallel to said fuse.

4,520,420
CURRENT CONTROL METHOD AND APPARATUS FOR ELECTROMAGNETIC VALVES

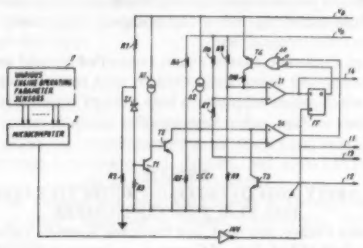
Hiromi Ariyoshi, and Iwao Yokomori, both of Kariya, Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

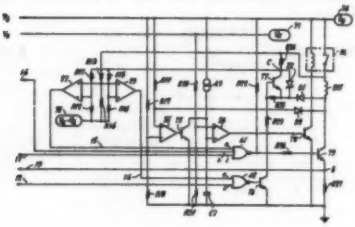
Filed Dec. 1, 1983, Ser. No. 556,779
Claims priority, application Japan, Dec. 1, 1982, 57-211848
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—154 **10 Claims**

1. A method for controlling the operating current of an electromagnetic valve in response to a variable duration pulse, comprising the steps of:
(a) coupling an energization voltage to an actuating coil of said electromagnetic valve in response to a leading edge of said pulse to initiate an energization current in said coil;
(b) detecting when said energization current reaches a predetermined peak value;
(c) decoupling said energization voltage from said coil to allow a circulating current to flow through a first path to decrease said circulating current at a higher rate;
(d) detecting when said circulating current decreases to a medium current value;
(e) switching said circulating current to a low resistance path to decrease said circulating current at a lower rate;
(f) detecting when said circulating current reaches a lower holding current value necessary to hold said electromagnetic valve operated;

(g) coupling said energization voltage to said coil to reinitiate said energization current;

(h) detecting when said energization current reaches a higher holding current value lower than said medium current value;





(i) decoupling said energization voltage from said coil to reinitiate said circulating current; and

(j) repeating the steps (f) to (i) until the occurrence of a trailing edge of said pulse.

4,520,421

SPECIMEN SUPPORTING DEVICE

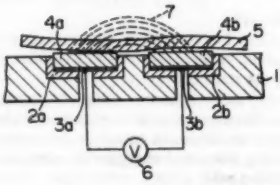
Yoshio Sakitani, and Yoshihisa Minamikawa, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 9, 1983, Ser. No. 521,610

Claims priority, application Japan, Aug. 11, 1982, 57-138583

Int. Cl.³ H01T *20/00*

U.S. Cl. 361—234 **26 Claims**



1. A specimen supporting device comprising means for supporting a specimen, said means including first and second specimen attracting portions arranged in opposed relation to one side of said specimen, and made of semiconductive dielectric material, and means for applying a voltage between said first and second specimen attracting portions in a manner to electrostatically attract said specimen to said first and second specimen attracting portions.

4,520,422

CERAMIC MULTILAYER ELECTRICAL CAPACITORS

William Borland, Gloucester, England, assignor to Engelhard Corporation, Iselin, N.J.

Filed Sep. 6, 1983, Ser. No. 529,417

Claims priority, application United Kingdom, Dec. 20, 1982, 8236210

Int. Cl.³ H01G *1/01*

U.S. Cl. 361—305 **19 Claims**

6. A multilayer capacitor having two or more electrodes of metals selected from the group consisting essentially of silver, palladium, gold and platinum and alloys of two or more of said metals, and dielectric layers disposed between said electrodes, the improvement comprising reducing the metal content of each of said electrodes to less than about 12 milligrams per square inch.

4,520,423

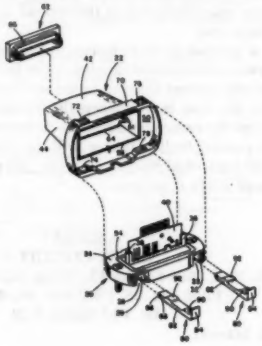
TAMPERPROOF, MOISTURE PROOF READOUT ENCLOSURE

Ray Sutherland, Hopwood, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 25, 1982, Ser. No. 436,255

Int. Cl.³ H02B *1/00*

U.S. Cl. 361—380 **11 Claims**



1. A tamperproof enclosure for a data readout device comprised of a base having a front wall, spacer means projecting rearwardly from said front wall terminating in a plane spaced rearwardly from said front wall, a cover comprised of a main body portion and mounted on said base, peripheral wall means formed on said cover bridging at least a portion of the space between said plane and said front wall and terminating in a free edge, openings in said peripheral wall means communicating with the space between said plane and said front wall, locking pin means received through said openings into the space between said plane and said front wall to prevent removal of said cover from said base.

4,520,424

VENTILATED INSTRUMENT PANEL SUPPORT RAIL

Paul E. Carpenter, Snohomish; Charles B. Fisher, Seattle, and Douglas E. Peash, Enumclaw, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Division of Ser. No. 315,838, Oct. 28, 1981, abandoned, and a continuation-in-part of Ser. No. 105,832, Dec. 20, 1979, abandoned. This application Jun. 13, 1983, Ser. No. 503,461

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—383 **1 Claim**

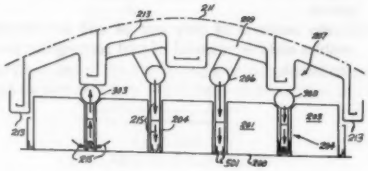
1. In combination in the flight deck panel region of an aircraft:

an instrument panel;

a plurality of dripshields disposed between the aircraft skin and a plurality of instrument modules distributed in spaced apart relationship between said instrument panel and said plurality of dripshields;

a plurality of instrument panel support rail assemblies, each of said plurality of instrument panel support rail assemblies disposed between said instrument modules;

each of said plurality of instrument panel support rail assemblies including a distribution manifold, and a support rail



for retaining said instrument modules in said distributed spaced apart relationship;

said distribution manifold including coupling means disposed between air supply ducting and said support rail;

said coupling means comprising a plurality of air passages distributed along said manifold adjacent said support rail for dispersing cooling air to said instrument modules; and,

wherein said cooling air source manifold includes a pressurization valve assembly for providing flow-through cooling of cathode ray tube instruments.

4,520,425

CONTROL APPARATUS WITH IMPROVED STRUCTURE FOR COOLING CIRCUIT ELEMENTS

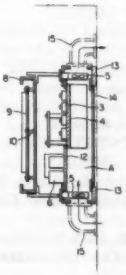
Eizi Ito, Komaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 10, 1983, Ser. No. 521,917

Claims priority, application Japan, Aug. 12, 1982, 57-122710; Aug. 12, 1982, 57-122712

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—384 **9 Claims**



7. An apparatus as claimed in claim 6, wherein said electrical circuit members are mounted on said dissipating element.

4,520,426

COOLING SUBRACK FOR LOGIC CARDS

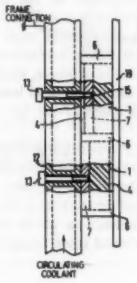
Herrmann Wessely, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Aug. 25, 1983, Ser. No. 526,403

Claims priority, application Fed. Rep. of Germany, Dec. 21, 1982, 3247240

Int. Cl.³ H05K *7/20*

U.S. Cl. 361—386 **6 Claims**



1. Subrack apparatus comprising:

a motherboard including a plurality of first contacts arranged in groups of contact arrays;

a plurality of grid elements connected to said motherboard and defining a grid including planar distributed chambers each containing a respective group of said first contacts;

a plurality of logic modules each disposed in a respective chamber and each including second contacts engaging respective first contacts, logic circuits connected to said second contacts and a first cooling plate in each chamber in thermal contact with said logic circuits; and

a common second cooling plate releasably mounted on said grid elements spaced from said motherboard a distance greater than the thickness of said logic modules and thermally connected to each of said first cooling plates.

4,520,427

ELECTRICAL CIRCUIT ASSEMBLIES

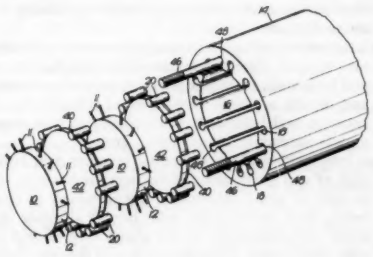
William A. Brotherton, Lothian, and Kenneth Street, Dunfermline, both of Scotland, assignors to Ferranti plc, Cheadle, England

Filed May 19, 1982, Ser. No. 379,768

Claims priority, application United Kingdom, May 29, 1981, 8116470

Int. Cl.³ H02B *1/00;* **H05K** *7/20;* **H01R** *13/00*

U.S. Cl. 361—389 **16 Claims**



1. An electrical circuit assembly comprising:

a housing including a hollow casing, and a bore extending through the casing;

a plurality of grooves provided in the internal surface of the hollow casing and extending longitudinally along the bore;

a stack of a plurality of modules secured within the casing bore, the modules having electrical connection leads extending in parallel planes from the modules into the grooves;

separate interconnection parts extending longitudinally along the grooves and at least partially residing in the grooves, at least some of the separate interconnection parts being electrically conductive;

the modules with connection leads and the separate interconnection parts being assembled in alternating fashion such that, within the grooves, there is a separate interconnection part on each side of at least those module connection leads which extend from intermediate modules of the stack; and

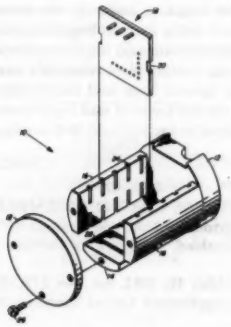
clamping means for developing longitudinal clamping force along the grooves for clamping the module leads and the separate interconnection parts together within the grooves, the module leads and the electrically conductive separate interconnection parts, when clamped, together comprising electrical interconnections.

4,520,428

DENSE PACKAGING SYSTEM FOR PRINTER WIRING BOARDS

Kenneth P. Lusk, Ridgecrest, Calif., assignor to The United State of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 576,295
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—399 **1 Claim**



1. A packaging system for transversely mounting at least one printed wiring board within a cylindrical housing, comprising:

at least two parallel, spaced apart bulkheads having an outer circumference;

at least one support plate extending between said bulkheads, said support plate being removably attached to each of said bulkheads at the periphery of each of said bulkheads, and having a planar face oriented toward the volume between said bulkheads and defining at least one transversely extending uninterrupted groove;

two interlocking plates extending between said bulkheads, each of said interlocking plates being removably attached to each of said bulkheads, at the periphery of said bulkheads, each interlocking plate having a planar face oriented perpendicularly to the planar face of said support plate and parallel to the planar face of the other interlocking plate, and defining at least one transversely extending interrupted groove in said planar face, said interrerpted groove having solid material between spaced adjacent inner ends, said interrupted groove being coplanar with said groove in said support plate; and

at least one rectangular printed wiring board having a slot in each of two opposite edges corresponding to the space between said abutting ends of said interrupted grooves, in each of said interlocking plates, and uninterrupted edges on the other two edges of said printed wiring board, said rectangular printed wiring board being inserted edgewise in said groove in said support plate, and being inserted edgewise in said interrupted grooves in said interlocking plates;

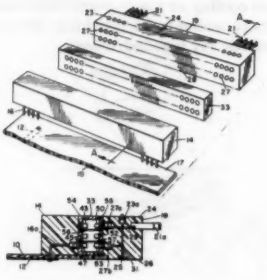
whereby removal of only one of said interlocking plates enables slidable removal of said rectangular printed wiring board.

4,520,429

DUAL-PATH CIRCUIT BOARD CONNECTOR WITH INTERNAL SWITCHING

Michael B. Hosking, Poway, Calif., assignor to General Dynamics Corporation, Electronics Division, San Diego, Calif.

Filed Dec. 19, 1983, Ser. No. 563,087
Int. Cl.³ H01R *23/68;* H05K *1/00;* H01H *9/26*
U.S. Cl. 361—413 **14 Claims**



1. A connector for selectively providing connections to a plurality of electrical circuits, comprising:

(a) a plurality of connector contacts for being engaged to form electrical connections;

(b) means for carrying said connector contacts; and

(c) switching means mounted in said carrying means and connected to said connector contacts and to associated electrical circuits for selectively providing connections between at least a pair of said connector contacts or between at least one of said electrical circuits and either contact of said pair.

4,520,430

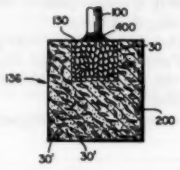
LEAD ATTACHMENT FOR TANTALUM ANODE BODIES

Noel V. Long, and Charles H. Mierke, both of Simpsonville, S.C., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Jan. 28, 1983, Ser. No. 461,967
Int. Cl.³ H01G *9/00*
U.S. Cl. 361—433 **7 Claims**

1. A tantalum anode body comprising a relatively high density tantalum region having an exposed surface and having a density of about 7 g/cc or higher and being metallurgically

bonded to a substantially larger relatively low density porous tantalum region formed of sintered tantalum powder having a



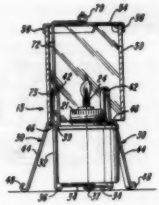
density of from about 3 to 5 g/cc and a tantalum wire attached to the high density tantalum region only at its exposed surface.

4,520,431

COLLAPSIBLE LANTERN

Michael W. Fanelli, and Edward R. Masters, both of 6099 Far Hills Ave., Dayton, Ohio 45459

Filed Jun. 11, 1984, Ser. No. 619,580
Int. Cl.³ F21L *19/00*
U.S. Cl. 362—180 **19 Claims**



1. A collapsible lantern comprising a container adapted to receive a liquid fuel and having means defining a top opening, a removable closure covering the top opening, a wick element extending from within the container upwardly through the opening, a fitting mounted on the closure and supporting the wick element, an annular transparent globe of sufficient size to surround the container, a plurality of peripherally spaced support members attached to the container and including leg portions movable between an inner retracted position and an outer supporting position to form a stabilized support for the container, the support members including means for supporting the globe in a lower collapsed position when the leg portion are in their retracted positions, and the support members including means for supporting the globe in an upper extended position surrounding the fitting and the wick element when the leg portions are in their supporting position.

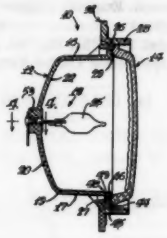
4,520,432

RECTANGULAR HALOGEN LAMP UNIT AND METHOD OF MANUFACTURE

William Mayer, and Alton E. Runions, both of Rochester, Ill., assignors to Stewart-Warner Corporation, Chicago, Ill.

Filed May 10, 1982, Ser. No. 376,619
Int. Cl.³ F21V *29/00*
U.S. Cl. 362—267 **10 Claims**

1. A method of making a rectangular sealed beam lamp unit having a paraboloidal plastic reflector with a sealed vent hole therein with a generally rectangular lens enclosing the reflector, including the steps of applying an adhesive to either of the mating surfaces of the reflector and lens, pressing the lens into engagement with the reflector, heating the resulting reflector-lens assembly with the vent hole open for a predetermined time and a predetermined temperature sufficient to create a bond between the adhesive and the lens and reflector permitting evolved gases to escape through the vent hole, applying a heat curable adhesive seal material to a vent hole plug, and inserting the vent hole plug in the vent hole in the reflector immediately



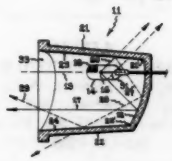
after the heating of the reflector while the reflector is still at an elevated temperature so that the residual heat in the reflector from the heating step cures the vent hole plug seal material.

4,520,433

MOTOR VEHICLE HEADLAMP

Walter J. Kosmatka, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 386,498, Jun. 9, 1982, abandoned. This application Aug. 30, 1984, Ser. No. 646,031
Int. Cl.³ F21V *7/00*; B60Q *1/00*
U.S. Cl. 362—296 **1 Claim**



1. A vehicle headlamp for forward illumination substantially devoid of upwardly directed glare light, comprising a concave parabolic reflector member truncated at opposite side thereof to provide two generally flat top and bottom sections substantially parallel to each other and to the optical axis of a curved portion of the reflector member, and a light source contained within said reflector member, said light source being enclosed within a bulb and consisting of a single filament located adjacent the optical axis as well as the focal point of said reflector and further located frontwardly of the junction between said flat sections with said curved portion of the reflector member, said filament also being devoid of shield means blocking its light rays from being projected to the curved portion of the reflector member, both of said generally flat top and bottom sections being non-reflective and with said top section being substantially closer to said optical axis than said bottom section so as to substantially reduce the reflecting surface in said reflector member above said optical axis.

4,520,434

DIFFUSION COVER FOR A MOTOR VEHICLE HEADLAMP

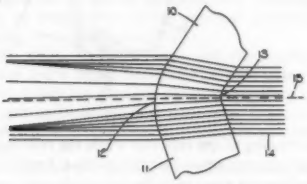
David A. Birt, Cannock, England, assignor to Lucas Industries, Birmingham, England

Filed Jul. 28, 1983, Ser. No. 518,107

Claims priority, application United Kingdom, Aug. 20, 1982, 8224035

Int. Cl.³ F21V *29/00*

U.S. Cl. 362—309 **2 Claims**



1. A diffusion cover for a motor vehicle headlamp, comprising:

upper and lower mutually inclined translucent cover portions which are integrally joined together to define therebetween a ridge on an outer surface of the cover and a trough on an inner surface of the cover, wherein the trough is disposed above the ridge;

concave means, comprising the inner surface of the upper cover portion in the region of the trough, for increasing the prismatic effect in said region in the direction of the trough;

convex means, integrally formed with said concave means and comprising the inner surface of the lower cover portion in the region of the trough, for increasing the prismatic effect in said region of the trough and in the direction of the trough, and the mutual disposition of the inner and outer surfaces of each cover portion in the respective regions of the ridge and the trough is such that light rays from a reflector of the headlamp which are incident upon the inner surface of the cover in use are not refracted upwardly upon passage through said regions of the upper and lower cover portions.

4,520,435

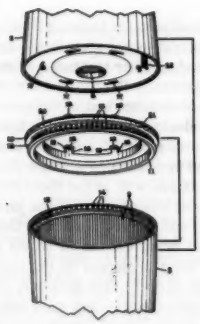
ORIENTABLE REFRACTOR MOUNTING

Samuel L. Baldwin, East Flatrock, N.C., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 4, 1983, Ser. No. 548,602

Int. Cl.³ F21V *3/00*

U.S. Cl. 362—311 **7 Claims**



1. An optical control appliance in the nature of a refractor or reflector adapted to surround at least in part the light source in a luminaire and mounting means therefor comprising:

a cylindrical neck portion on said appliance,

a mounting ring having a collar portion fitting said neck portion with matching diameters,

a mating ridge and groove, one on the collar portion and the other on the neck portion, said ridge causing diametric interference with the portion next to the groove to an extent allowing a snap fit,

and attachment means on said ring for engaging a luminaire housing.

4,520,436

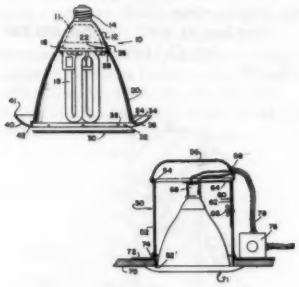
LAMP APPARATUS

Rhett McNair, Anaheim, and James Helling, Newport Beach, both of Calif., assignors to NRG Inc. MN, Edina, Minn.

Filed Mar. 25, 1983, Ser. No. 479,059

Int. Cl.³ F21S *1/02*; F21V *21/04*

U.S. Cl. 362—366 **20 Claims**



1. An apparatus for use in a fluorescent lamp assembly having a fluorescent lamp, a ballast housing and a screw connector for connecting to a conventional screw socket on a support in a recessed can fixture mounted in a ceiling opening, said apparatus comprising:

means defining a reflector, a trim ring means and a ballast housing connecting means,

said reflector having a first small end and a second large end,

said ballast housing connecting means for connecting the first small end of the reflector to the ballast housing,

said trim ring means extending generally radially outward from the second large end of the reflector and extending generally towards said screw connector, said trim ring means for being drawn aganist said ceiling opening when the screw connector is screwed into said socket concealing said ceiling opening.

4,520,437

POWER CONVERSION CIRCUIT FOR SYNTHESIZING A SINEWAVE WITH PROGRAMMED AMPLITUDE CONTROL

Charles W. Boettcher, Jr., Chester; Billy H. Hamilton, Summit; William M. Slak, Convent Station, and Walter L. Zweig, Rockaway, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jul. 14, 1983, Ser. No. 513,691.

Int. Cl.³ H02M *1/12*; H02P *13/18*

U.S. Cl. 363—41 **8 Claims**

1. A power conversion circuit for synthesizing a low frequency sinewave signal;

input means for accepting a source of energy,

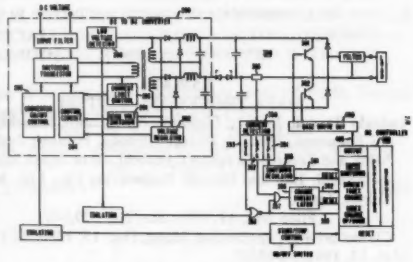
means for converting the energy at the input means into a pulse carrier signal,

means for modulating the pulse carrier signal by supplying timing signals to the means for converting, comprising:

means for generating timing signals, including: a data pro-

cessor under stored program control, a memory including a stored program for controlling the processor and a plurality of tables including timing signal data, each table being responsible for producing a different output sine-wave signal amplitude, whereby the stored program selects one of the plurality of tables and utilizes its timing signal data for generating timing signals operative for modulating the pulse carrier

output means for coupling to a load and including filtering means,



means for detecting an average current overload condition,

means for limiting average current output responsive to the means for detecting including:

instructions in the stored program for selecting a different one of the plurality of tables of timing signal data for reducing an amplitude of the output sinewave signal and continuing to select different ones of the plurality of tables to successively reduce amplitude of the output sinewave signal until the average current overload condition is corrected.

4,520,438

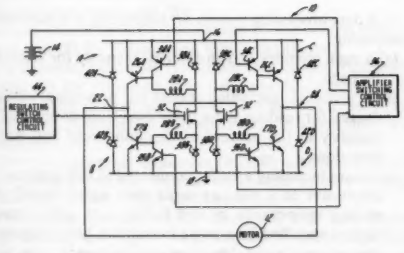
AMPLIFIER POWER STAGE

Peter Norton, 170 Beaver Brook, Lincoln Park, N.J. 07035

Filed Jul. 25, 1983, Ser. No. 516,574

Int. Cl.³ H02P *13/20*

U.S. Cl. 363—98 **13 Claims**



1. A switching amplifier comprising:

first, second, third and fourth high current transistors each having its emitter-to-collector circuit connected in a respective arm of a bridge circuit which has diagonally opposite supply voltage terminals and diagonally opposite output terminals,

first, second, third and fourth base current shunting means connected in shunt with the respective base-to-emitter circuits of the first, second, third and fourth high current transistors,

first and second inductors coupled respectively with the bases of the first and second high current transistors and in series with a first base current regulating switch,

third and fourth inductors coupled respectively with the bases of the third and fourth high current transistors and in series with a second base current regulating switch,

and first, second, third and fourth unidirectional conducting means connected respectively in series with the first, second, third and fourth inductor and the base-to-emitter circuit of the first, second, third and fourth high current transistor.

4,520,439

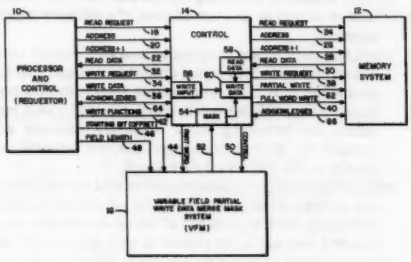
VARIABLE FIELD PARTIAL WRITE DATA MERGE

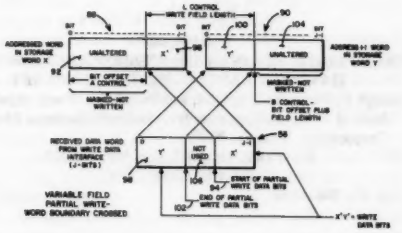
Arnolds E. Liepa, St. Paul, Minn., assignor to Sperry Corporation, New York, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,340

Int. Cl.³ G06F *9/00, 9/12*

U.S. Cl. 364—200 **23 Claims**





1. In a memory system having an addressable main memory with reading and writing circuitry for reading and writing an even addressed data word and an odd addressed data word during the same memory reference cycle, wherein each stored data word is comprised of a predetermined number of bits, even address and odd address read registers for storing even and odd addressed data words read from the memory, even address and odd address write registers for storing even and odd addressed data words to be stored in memory, a write register for storing a field of data bits to be written, a variable field writing control system for merging a programmably selected field of data bits within a selected one of the even address or odd address data words, or both, while retaining all bits not within the selected variable bit field unaltered as read from the memory, the variable bit field writing control system comprising:

starting bit receiving means for receiving starting bit offset signals indicative of the selected bit position location of a starting bit in a variable bit field to be written in an addressed memory word;

field length receiving means for receiving field length signals indicative of the number of bit positions in a selected variable field that is to be written;

trailing bit determining means coupled to said starting bit receiving means and said field length receiving means for

providing trailing bit signals indicative of the last bit in said selected variable field length bit grouping that is to be written, wherein said trailing bit determining means includes

adder means for numerically adding said starting bit offset signals and said field length signals and providing sum signals indicative of the trailing bit plus one position and a carry signal for said selected variable field,

carry signal output means for providing said carry signal indicative that a selected variable field will extend beyond the bit position limits of the addressed data word and word boundary crossing to the data word stored in the next sequential address will occur,

trailing bit plus one output means coupled to said adder means for providing trailing bit plus one signal indicative of the bit location of the first bit position following said selected variable bit field to be written;

address means for receiving signals indicative of initial selection of an odd or an even address of a memory word to be accessed;

word selection means coupled to said field length receiving means and said carry signal output means and said address means for providing word select signals to said merging means for providing word select signals to said merging means for providing word boundary crossing when a variable bit field to be merged can not be written completely in the addressed data word;

mask bit generating means coupled to said starting bit receiving means and to said trailing bit determining means for providing mask signals for all bit positions that are to be retained and not to be altered in said data words; and

merging means coupled to said mask bit generating means for merging data bits to be written with data bits in said memory locations corresponding to said mask signals.

4,520,440

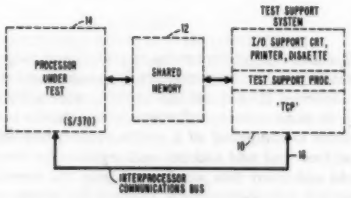
TEST VERIFICATION OF PROCESSOR ARCHITECTURE HAVING A PARTIAL INSTRUCTION SET

Joseph P. Buonomo, Endicott, and Wendell L. Perry, Apalachin, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 15, 1982, Ser. No. 449,929

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **11 Claims**



1. A method for verifying the architectural integrity of a processor under test having a limited instruction set, said method comprising the steps of:

(a) providing a test support processor connected to communicate with the processor under test;

(b) providing input/output support, including at least the capability for a display terminal, a printer and a disk drive, connected to said test support processor for use in association with said processor under test;

(c) providing a minimally sized test control program to read test cases and initialize memory with data for an instruction to be tested, said test control program initializing the registers of said processor under test;

(d) providing storage means, connected between said processor under test and said test processor, that is accessible and is to be shared by both of the processors;

(e) loading said test control program into said shared memory and loading data sufficient to test one of the instructions of said limited instruction set of said processor under test into said shared memory, said test control program initiating execution of said one of the instructions by initiating execution of said data loaded into said shared memory;

(f) passing verification test control to said processor under test to thereby cause execution of said instruction thereof; and thereafter

(g) said test control program capturing and storing the results of execution of said instruction in said shared memory for subsequent inspection and comparison to desired results.

4,520,441

DATA PROCESSING SYSTEM

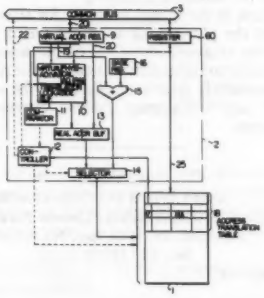
Tadaaki Bandoh, Ibaraki; Hidekazu Matsumoto, Hitachi; Yasushi Fukunaga, Hitachi; Ryosei Hiraoka, Hitachi; Jushi Ide, Mito, and Tetsuya Kawakami, Hitachi, all of Japan, assignors to Hitachi, Ltd. and Hitachi Engineering Co., Ltd., both of Tokyo, Japan

Filed Dec. 11, 1981, Ser. No. 329,949

Claims priority, application Japan, Dec. 15, 1980, 55-175863; Mar. 13, 1981, 56-35347

Int. Cl.³ G06F *13/00*

U.S. Cl. 364—200 **3 Claims**



1. A data processing system for supporting a virtual memory comprising:

(a) a main memory and an external memory for storing data by page;

(b) a processor including means for providing virtual addresses for reading and writing data from or into said main memory in the process of executing read and write instructions;

(c) means including a buffer connected to said processor and responsive to a memory write start signal therefrom for storing temporarily in said buffer both said virtual addresses specified by a write instruction being executed by said processor and data from said processor to be written into a page of said main memory at physical addresses corresponding to said specified virtual addresses and for writing successively said data from said buffer into said page of said main memory at said physical addresses;

(d) an address translator connected between said main memory and said buffer for translating said virtual addresses received from said buffer to said physical addresses and including means for producing a page fault signal to said processor when the desired page into which said data is to be written is not contained in said main memory at the time of said address translation; and

(e) wherein said processor includes means for temporarily sending all virtual addresses and data relating to the execution of a given write instruction to said buffer, means for temporarily writing said virtual addresses and data from

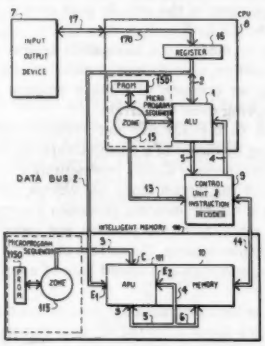
said buffer into a work area of said main memory in response to a page fault signal, means for effecting the loading of said desired page into said main memory from said external memory in response to the page fault signal and means for loading said virtual addresses and data from said work area into said buffer to write that data in said page loaded in said main memory at the physical addresses corresponding to the virtual addresses also stored in said buffer.

4,520,442

DIGITAL DATA PROCESSING AND STORAGE SYSTEM ESPECIALLY FOR A TOMODENSITOMETER, AND A TOMODENSITOMETER EQUIPPED WITH SAID SYSTEM

Martine Grimberg, and Alain Berard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jul. 1, 1981, Ser. No. 279,628
Claims priority, application France, Jul. 4, 1980, 80 14909
Int. Cl.³ G06F *15/42*
U.S. Cl. 364—414 **5 Claims**



1. A digital data processing and storage system, for use in processing data for producing tomodensitometric images on an imaging device, comprising:

a central processing unit (8);

an input/output device (7) connected to said central processing unit (8) for transmitting input data thereto;

an arithmetic/logic unit (1) within said central processing unit (8) for receiving said data and having means for performing first arithmetic functions thereon to form, in a first step, intermediate periodic results in accordance with said data;

a first microprogram sequencer (15,150) within said central processing unit (8), connected to said arithmetic/logic unit (1) for controlling said functions;

an intelligent memory (100) connected with said central processing unit (8) for receiving therefrom said periodic results, and a control device (9) connected between said central processing unit (8) and said intelligent memory (100) for controlling and initializing said memory (100);

said intelligent memory (100) comprising a conventional storage memory (10), at least one auxiliary processing unit (101) connected with said central processing unit (8) to receive said intermediate periodic results therefrom and for performing, in a second step, arithmetic/logic functions with said periodic results so as to produce image reconstruction signals, whereby said central processing unit (8) is relieved of some of said functions, and a second microprogram sequencer (115,1150) connected to said auxiliary processing unit (101) to control the operations thereof;

whereby said auxiliary processing unit (101) operates on said periodic results and the contents of said memory (10); and

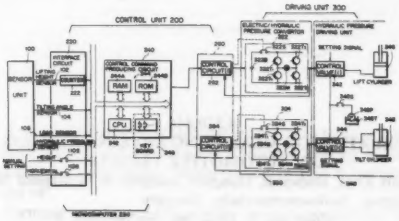
means for initializing said second microprogram sequencer (115,1150) and thereafter operating at a rate determined by the input to said intelligent memory (100) of said periodic results.

4,520,443

CONTROL DEVICE FOR LOADING AND UNLOADING MECHANISM

Katsumi Yuki, Toyota; Susumu Yoshida, Aichi; Mineo Ozeki, Ichinomiya; Yasuyuki Miyazaki, Aichi, and Masaru Kawamata, Numazu, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho and Kabushiki Kaisha Meidensha, both of, Japan

Filed Mar. 31, 1982, Ser. No. 364,404
Claims priority, application Japan, Mar. 31, 1981, 56-47737; Mar. 31, 1981, 56-45960[U]
Int. Cl.³ B66F *9/06*
U.S. Cl. 364—424 **10 Claims**



1. In a control device for a loading and unloading mechanism adapted to a fork lift truck comprising:

(a) a sensor means (100) including a lifting height sensor means (102) for measuring the lifting height of a fork and providing an output signal indicative thereof, and an inclination sensor means (104) for measuring the inclination of an upright and producing an output signal indicative thereof;

(b) an interface circuit (220), provided in a control unit (200), including a lifting height counter means (222) for counting output signals from the sensor means;

(c) a control command producing circuit (240) provided in the control unit (200), said control command producing circuit (240) including a memory means (244) for storing data indicative of lifting height and inclination required for running attitude control, and data setting means (246) for setting data indicative of running attitude into memory, said control command producing circuit (240) producing a command signal indicative of valve opening based on a comparison between the output signals of the sensor means (100) and the data stored in the memory means;

(d) a servomotor driving circuit means (320) responsive to the command signal indicative of valve opening from the control unit for producing a drive control signal, and

(e) a hydraulic pressure driving circuit means (340) responsive to the drive control signal for producing a control signal for hydraulically controlling a lift cylinder (346) and a tilt cylinder (348),

the improvement wherein

said sensor means (100) further includes a load sensor (106) comprising at least one of means for detecting hydraulic pressure and means for decreasing air pressure in a front wheel of the fork lift truck,

said data setting means (246) includes a push-button switch means ($246S_1$) for generating a fork attitude control command,

said control command producing circuit (240) includes horizontal positioning means responsive to the push-button switch means after pick-up or stacking of a load is com-

pleted, to produce said command signal indicative of valve opening for controlling the tilt cylinder in accordance with an angle of inclination preselected by an output signal of said load sensor and in accordance with the output signal from said inclination sensor means, thereby effecting a horizontal positioning control, and

a control circuit (160) provided in said control unit (200) comprising adjusting means for adjusting a preset inclination of the fork in accordance with the nature or shape of a load and providing an output voltage, and comparing means for comparing the output voltage of said adjusting means with a voltage proportional to rearward inclination of the tilt cylinder, whereby when the former is equal to the latter under the condition that the fork is at a predetermined lifting height, said control circuit produces a control signal for stopping the operation of the tilt cylinder.

4,520,444

APPARATUS FOR MEASURING BRAKING ACTIONS OF AN AUTOMOTIVE VEHICLE

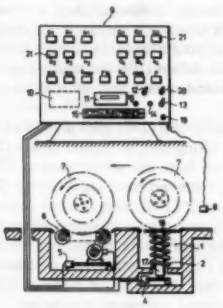
Rudolf Koos, Budapest, Hungary, assignor to Metripond Merleggyar, Hodmezovasarhely, Hungary

Filed Jul. 8, 1982, Ser. No. 396,443

Claims priority, application Hungary, Jul. 22, 1981, 2135/81

Int. Cl.³ G01L *5/28;* **G06F** *15/20*

U.S. Cl. 364—426 **2 Claims**



1. In apparatus for measuring braking actions of an automotive vehicle with a braking power test stand, a computing unit for computing braking characteristics, a storage unit for storing identifying data of the automotive vehicle, and an indicating or recording unit for indicating or recording braking characteristics; the improvement comprising a plurality of weight measuring units for respectively measuring the weight exerted on each wheel of said vehicle (1), the number of which weight measuring units corresponds to the number of wheels (7) present on one axle of the automotive vehicle to be tested; one output of the braking power test stand (6) and respectively one output of each of the weight measuring units (1) being connected to respective separate inputs of the computing unit (10) for computing the braking characteristics of each wheel on said one axle, and one output of the computing unit (10) and one output of the storage unit for identifying data of the automotive vehicle being connected to respective separate inputs of the indicating or recording unit (11) for separately indicating or recording the braking characteristics of each wheel of said one axle.

4,520,445

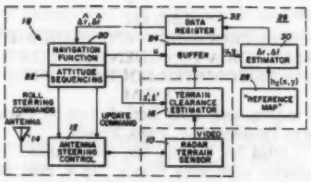
METHOD OF DETERMINING THE POSITION AND VELOCITY OF A VEHICLE

Larry R. Keearns, Dallas, Tex., assignor to E-Systems, Inc., Dallas, Tex.

Continuation of Ser. No. 248,803, Mar. 30, 1981, Pat. No. 4,495,580. This application Feb. 7, 1984, Ser. No. 577,761

Int. Cl.³ G06F *15/50*

U.S. Cl. 364—450 **4 Claims**



1. A method of determining the position and velocity of a vehicle independent of the vehicle path over a given terrain, comprising the steps of:

generating by means of a navigation system and a terrain sensor position, altitude and vertical velocity signals representing an estimate of vehicle position and velocity while moving over the terrain,

in response to the altitude and vertical velocity signals, generating by means of a terrain clearance estimator vehicle terrain clearance signals representing the vehicle clearance above the terrain along the vehicle path,

generating in a computational processor a corrected vehicle position signal from the position and velocity signals of the navigation system, the terrain clearance signal of the clearance estimator and stored data of a terrain elevation map,

generating in the computational processor a corrected vehicle velocity signal from the velocity signals of the clearance estimator, the terrain clearance signals, and the stored data of the terrain elevation map; and

inputting the corrected position signal and the corrected velocity signal to the vehicle navigation system to generate steering commands to a vehicle control unit.

4,520,446

APPARATUS FOR CONTROLLING A PLURALITY OF STUD TENSIONING DEVICES

Yoshinori Sato, Kanagawa, Japan, assignor to The Japan Steel Works, Ltd., Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,699

Claims priority, application Japan, Dec. 25, 1981, 56-209362

Int. Cl.³ G06F *15/52;* **B25B** *29/02;* **C23F** *15/00*

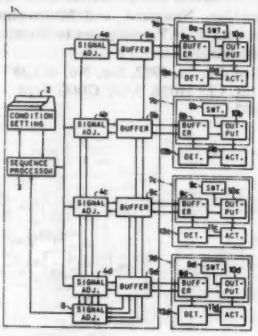
U.S. Cl. 364—468 **5 Claims**

1. An apparatus for automatically controlling a plurality of stud tensioning devices by sequentially transmitting a plurality of control signals thereto, said plurality of control signals indicating a plurality of operative steps to be completed by each of said stud tensioning devices, said plurality of stud tensioning devices receiving each control signal simultaneously, each of said stud tensioning devices being disabled, upon completion of each of said operative steps, independently from the other said stud tensioning devices, said apparatus comprising:

a central control means for sequentially outputting a plurality of control signals;

a plurality of stud tensioning devices, each of said stud tensioning devices receiving each of said control signals, each of said stud tensioning devices producing a step comple-

tion signal upon the completion of any given operative step indicated by a given control signal;



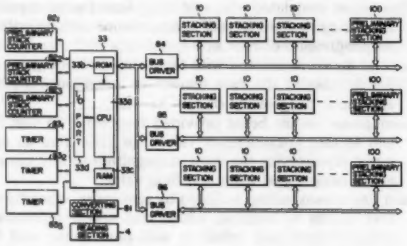
said central control means outputting a subsequent control signal only when it receives said step completion signal from each of said stud tensioning devices.

4,520,447

SORTER WITH AUTOMATIC DISCHARGING UNIT

Seietsu Nara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 496,991
Claims priority, application Japan, May 29, 1982, 57-91698
Int. Cl.³ G06F *15/24;* B07C *5/00*
U.S. Cl. 364—478 **16 Claims**



1. A sorter with an automatic discharging unit, comprising:

(a) reading means for reading sorting information assigned to paper sheets;

(b) a plurality of stacking sections vertically disposed in a plurality of rows for stacking the paper sheets, each of said plurality of stacking sections being provided with a discharging mechanism;

(c) sorting/stacking means for sorting/stacking the paper sheets in said plurality of stacking sections in accordance with the sorting information from said reading means;

(d) transferring means, sequentially opposing said plurality of stacking sections, for receiving the paper sheets discharged by said discharging mechanism from each of said plurality of stacking sections;

(e) a preliminary stacking section with a discharging mechanism for stacking therein paper sheets intended to be stacked in a given one of said plurality of stacking sections while the paper sheets already stacked in said given one of said plurality of stacking sections are being discharged;

(f) timer means for counting a predetermined time interval during which said preliminary stacking section opposes said given one of said plurality of stacking sections, and for producing a timeout signal when the predetermined time interval has elapsed; and

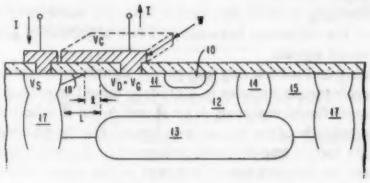
(g) controlling means for receiving the timeout signal from said timer means to drive said discharging mechanism of said preliminary stacking section.

4,520,448

METHOD OF CHARACTERIZING RELIABILITY IN BIPOLAR SEMICONDUCTOR DEVICES

Bernard Tremintin, Orvault, France, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 18, 1982, Ser. No. 435,139
Claims priority, application France, Oct. 28, 1981, 81 430036
Int. Cl.³ G01R *31/26, 31/02*
U.S. Cl. 364—488 **4 Claims**



1. A method of characterizing reliability in bipolar semiconductor devices manufactured in a selected line, by means of a determined technology, characterized in that it includes the steps of:

forming bipolar semiconductor devices comprising at least one test structure of the FET type, in said manufacturing line,

selecting a plurality of said devices, each having an interface charge density, an oxide charge density and an equivalent thickness of the oxide,

computing for each of the selected devices, from the test structure, a reliability function R substantially equal to product $N_{SS} \times N_{eff}$, wherein N_{SS}, is the interface charge density, and N_{eff}, is the oxide charge density,

determining the time-to-fail T after a selected time T_{50}, for said selected devices,

plotting curve $R = f(T)$, and

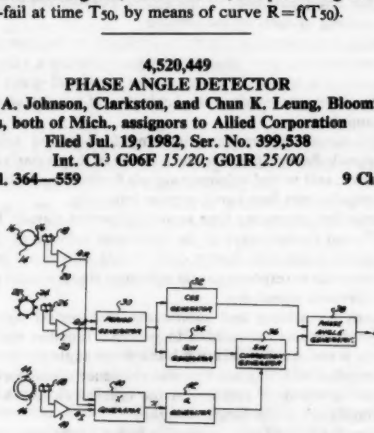
calculating, for any other device produced in the selected manufacturing line, its function R, and predicting its time-to-fail at time T_{50}, by means of curve $R = f(T_{50})$.

4,520,449

PHASE ANGLE DETECTOR

Edwin A. Johnson, Clarkston, and Chun K. Leung, Bloomfield Hills, both of Mich., assignors to Allied Corporation

Filed Jul. 19, 1982, Ser. No. 399,538
Int. Cl.³ G06F *15/20;* G01R *25/00*
U.S. Cl. 364—559 **9 Claims**



1. A method for generating a signal indicative of the phase angle ϕ of torque impulses imparted to a rotary member comprising the steps of:

sensing the rotation of the rotary member with a first sensor

to generate pulse reference signals indicative of at least one predetermined angular position of the rotary member with respect to each torque impulse;

sensing the rotation of the rotary member with a second sensor between said pulse reference signals to generate period signals indicative of the rotational velocity of the rotary member during predetermined equal angular intervals during each torque impulse;

sensing the rotation of the rotary member with a third sensor, immediately following each pulse reference signal to generate two sequential speed signals indicative of the instantaneous rotational velocity of the rotary member at said at least one predetermined angular position of the rotary member;

generating a correction factor having a value proportional to the difference between said two sequentially generated speed signals;

adding and subtracting said period signals corrresponding to each torque impulse in a predetermined sequence to generate function signals A sin ϕ and A cos ϕ where A is the amplitude of the torque impulse and ϕ is the phase angle of the torque impulse with reference to the reference signal and in the direction of rotation of the rotary member;

adding said correction factor to said function signal A sin ϕ to generate a corrected function signal A sin ϕ;

dividing said corrected function signal A sin ϕ and said function signal A cos ϕ, one by the other, to generate an address to a look-up table storing the value of the phase angle ϕ as a function of the arctangent (A sin ϕ/A cos ϕ); and

addressing said look-up table with said address to generate said phase angle ϕ corrected for the change in the rotational speed of the rotary member due to the torque impulse.

7. A circuit for generating a phase angle signal indicative the phase angle of the individual torque impulses produced by the individual pistons of an internal combustion engine on the engine's crankshaft comprising:

first sensor means responsive to the rotation of the engine's crankshaft to generate reference signals θ_R indicative of the beginning of each torque impulse;

second sensor means responsive to the rotation of the engine's crankshaft and said reference signal θ_R for sequentially generating speed signals having values indicative of the rotational speed of the engine's crankshaft at the beginning of each torque impulse;

means for generating a correction factor in response to said sequentially generated speed signals having a value proportional to the difference in the rotational speed of the engine's crankshaft at the beginning of successive torque impulses;

third sensor means for generating four period reference signals θ_P in response to the rotation of the engine's crankshaft, said period reference signals θ_P dividing each torque impulse into four equal angular intervals;

means for generating four sequential period signals, P_1, P_2, P_3 and P_4 indicative of the rotational velocity of the engine's crankshaft during each of said four equal angular intervals in response to said reference signal θ_R and period reference signals θ_P;

means for adding and subtracting said period signals in predetermined sequences to generate function signals A sin ϕ and A cos ϕ where ϕ is the phase angle of the torque impulse with reference to said reference signal θ_R and in the direction of rotation of the crankshaft and A is the amplitude of the torque impulse;

means for adding said correction factor to the value of said function signal A sin ϕ to generate a corrected function signal A sin ϕ; and

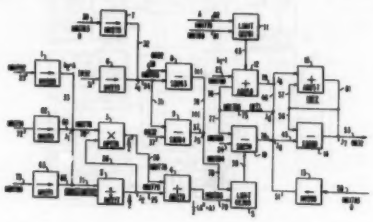
means for generating a value for the phase angle ϕ from the value of said corrected function signal A sin ϕ and the value of said function signal A cos ϕ.

4,520,450

DIGITAL RAMP FUNCTION GENERATOR AND MOTOR DRIVE SYSTEM INCLUDING THE SAME

William H. Snedden, Newstead, and Mohammed Safiuddin, Williamsville, both of N.Y., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 23, 1982, Ser. No. 401,287
Int. Cl.³ H03K 5/08; G06G 7/18
U.S. Cl. 364—607 **4 Claims**



2. In a DC motor drive system controlled by a speed control signal to assume a corresponding motor speed, with a ramp function generator being provided responsive to a speed reference signal related to an assigned motor speed for generating a corresponding control signal;

said ramp function generator being operative in relation to a change in said speed reference signal from an initial to a final value thereof for providing an instantaneous signal therebetween;

the combination of:

programmable controller means for selecting a rate k_2 for said ramp function generator;

first means associated with said ramp function generator for increasing the rate thereof in accordance with an arithmetic progression of root $k_1=1$;

second means associated with said ramp function generator for decreasing the rate thereof in accordance with an arithmetic progression of root $k_1=1$;

comparator means being provided responsive to said final and to said instantaneous values for providing an error signal representing the want in magnitude of said instantaneous ramp signal from said final value;

said first means beeing actuated by said error, whereby said first means is initiated when said speed reference is changed from said initial to said final value; said first means being deactivated when said rate has reached k_2;

said second means being initiated when said error signal is equal to $\frac{1}{2}k_2(k_2+1)$ whereby said second means brings said instantaneous ramp signal to said final value when the rate of said ramp function generator has been reduced to zero.

4,520,451

PROGRAMMABLE VENDING MACHINE ACCOUNTABILITY APPARATUS

Donald L. McLaughlin, Newton Square, Pa., assignor to Mars Incorporated, McLean, Va.

Filed Sep. 30, 1981, Ser. No. 307,183
Int. Cl.³ G06F 9/00, 13/00
U.S. Cl. 364—900 **19 Claims**

1. A programmable accountability apparatus for installation and use with any of a plurality of particular types of vending machines for monitoring vending functions without rewiring the vending machine in which it is installed, comprising:

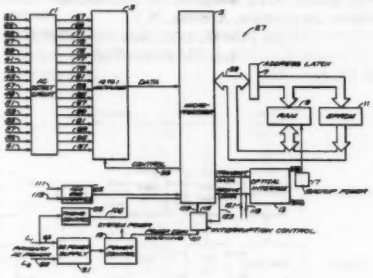
a plurality of monitoring wires attachable to a plurality of points within the vending machine which carry AC signals and which have been selected for monitoring,

means for converting the AC signals to digital signals,

a microprocessor programmed to monitor and collect data from the digital signals,

memory, operatively associated with the microprocessor, for storing data collected from the digital signals, a fixed operating program, and program data for programming the microprocessor,

said program data comprising a selected digital word comprising a plurality of bits for each of the plurality of monitoring wires, the bits of the word selected for each such wire determining the data to be collected and stored by the microprocessor upon the occurrence of the AC signal monitored by that wire, the program data serving to adapt the accountability apparatus for each particular type of vending machine.



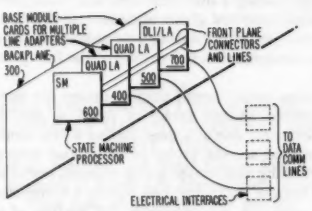
4,520,452
MEMORY SELECTION IN A MULTIPLE LINE ADAPTER ORGANIZATION

Richard A. Loskorn, Dana Point, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 358,651, Mar. 16, 1982, abandoned. This application Sep. 10, 1984, Ser. No. 649,148

Int. Cl.³ G06F *15/16, 13/00, 3/00*

U.S. Cl. 364—900 **5 Claims**



1. In a line support processor for controlling data transfer operations between a host computer and a remote data terminal wherein said line support processor includes a plurality of line adapters, a data link interface unit and a microprocessor means, said microprocessor means including program data in an internal ROM and in external RAM storage means and having an I/O bus and output control registers providing control data and information data to said line adapters, a line adapter memory selection system comprising:

(a) a plurality of line adapters wherein each line adapter includes:

(a1) input/output circuit means connecting a data terminal to a first switching means;

(a2) first switching means, controlled by said microprocessor, for transferring data from said microprocessor means to said input/output circuit means, or transferring data from said input/output circuit means to a multiplexor means;

(a3) multiplexor means, having an output to said I/O bus, for conveying data bytes from a selected one of said input-/output circuit means;

(a4) line adapter memory means, connected to said I/O bus, for buffering data being transferred between said microprocessor means and said data terminal; said line adapter memory means including a plurality of RAM storage means, each one of said RAM storage means being dedicated to a set of first and second line adapters and having upper and lower memory areas dedicated respectively to said first and second line adapters;

(b) means for selecting a particular area of a line adapter memory means and addressing said area of line adapter memory means;

(c) said microprocessor means for transmitting identification signals to said means for selecting and for generating address data to said means for selecting.

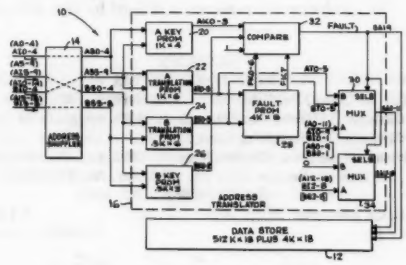
4,520,453
ADDRESS TRANSFORMATION SYSTEM HAVING AN ADDRESS SHUFFLER

Yechow T. Chow, Upper Estate Kowloon, Hong Kong, assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 1, 1982, Ser. No. 438,290

Int. Cl.³ G06F *9/32*

U.S. Cl. 364—900 **23 Claims**



1. An address transformation system for processing addresses for a data store having a plurality of addressable locations, some of which might be defective and some of which are nondefective, the address transformation system comprising:

an address shuffler coupled to receive a data store input address from a set of data store input addresses and output in response thereto a corresponding shuffled address from a set of shuffled addresses which is the same as the set of data store input addresses, with each shuffled address corresponding to exactly one data store input address and with a plurality of the shuffled addresses within the set of shuffled addresses each being different from its corresponding data store input address; and

an address translator coupled to receive a shuffled address and output in response thereto, a corresponding valid store address from a set of valid store addresses in which each valid store address identifies a nondefective addressable location within the data store.

4,520,454
MAKEREADY SYSTEM

Charles H. Dufour, and Jonathan G. Newman, both of Westerly, R.I., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 967,697, Dec. 8, 1979, abandoned. This application May 13, 1983, Ser. No. 494,671

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1977, 2754941

Int. Cl.³ G06F *3/12, 3/14*

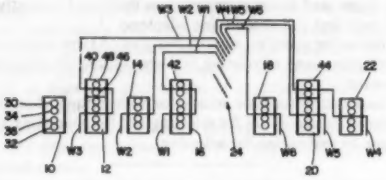
U.S. Cl. 364—900 **23 Claims**

1. In a method of making ready a multi-unit, multi-web

printing press for printing a publication and prior to operating the press, the steps of:

entering data into an electronic data processing apparatus, said data representative of the number of pages for each section and which pages of each section are to be printed in one or more colored inks;

determining and providing from the inputted data as well as



from previously stored layout information in said apparatus particular to said press and its configuration, output data representing acceptable page printing plate positions on the various plate cylinders of the press;

providing a readout in accordance with the outputted data providing information showing the correct page printing plate positions on the various plate cylinders of the press for producing the publication defined by said readout.

4,520,455

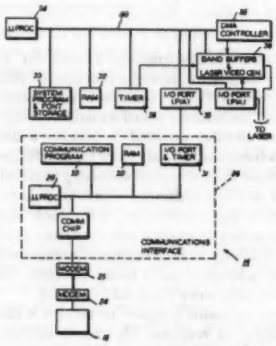
PRINTING SYSTEM

Peter A. Crean, Penfield; Remo J. D'Ortenzio, Rochester, and Carolyn P. Grow, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 376,884, May 10, 1982, Pat. No. 4,476,542. This application May 24, 1984, Ser. No. 613,484

Int. Cl.³ G06F *3/12*

U.S. Cl. 364—900 **5 Claims**



1. In character printing a method of formatting the characters to be printed into binary signals to act as control signals for an on/off print mechanism comprising the steps of

storing signals representing the characters to be printed in a signal storage member according to a scheme related to the desired appearance of those characters on a print media;

formatting and storing binary signals to control the printing of a portion of each character across a print width until the binary signals for an entire print width are stored, and

directing the on/off printing operation of a print medium's print width by serially accessing the stored binary signals for that print width and using those signals to control the on/off mechanism; and

repeating said steps of formatting, storing, and directing until all characters have been printed.

4,520,456

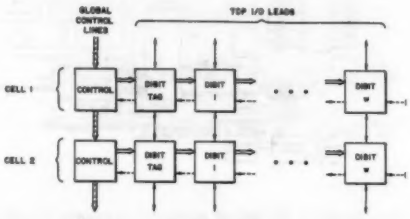
DUAL RECIPROCATING PIPELINED SORTER

Glen S. Miranker, San Francisco, Calif., and Chak-Kuen Wong, Mt. Kisco, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 18, 1983, Ser. No. 467,975

Int. Cl.³ G06F *7/06*

U.S. Cl. 364—900 **8 Claims**



1. Sort mechanism, for stored digital data, having an array of cells in which data bits are stored, each cell having capability to store equivalent bits of each of a plurality of items, and having a comparator for determining the mutual relationship of the plurality of items according to a sort criterion, and gating means related to the comparison and criterion for establishing a semi-sort during data input to the sorter and for establishing a complementary semi-sort during subsequent data output from the sorter characterized by

(a) sorter stack means comprising an array of cells in a double-ended configuration with top and bottom ends, a top entry/exit cell at the top end and a bottom entry/exit cell at the bottom end;

(b) top input/output control means for distributing an unordered first group of items to said top entry/exit cell, one at a time, during a first semi-sort, and subsequently for distributing said first group of items, one at a time, from said top entry/exit cell during a complementary second semi-sort, to accomplish full sorting of the first group of items; and

(c) bottom input/output control means for distributing an unordered second group of items to said bottom entry/exit cell, one at a time, during a first semi-sort of the unordered second group of items and subsequently for distributing said second group of items, one at a time, from said bottom entry/exit cell during a complementary second semi-sort, to accomplish full sorting of said second group of items.

4,520,457

KEY-CONTROLLED METHOD FOR INVOKING AUTOMATIC ROW AND COLUMN ADDITION IN AN INTERACTIVE TEXT PROCESSING SYSTEM

Brenda J. Hagler, Georgetown, and James T. Repass, Round Rock, both of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 13, 1981, Ser. No. 311,085

Int. Cl.³ G06K *1/20*; G06F *3/023*

U.S. Cl. 364—900 **5 Claims**

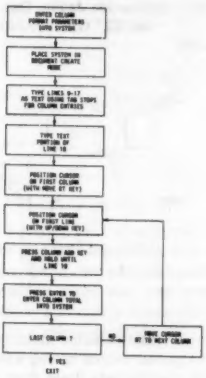
1. In an interactive text processing system having a display screen including a positionable cursor, a microprocessor including a memory, and an accumulator, and a keyboard to permit entry of data and control information into said system by an operator interactively, an improved method for assisting said operator in adding a plurality of numbers which are displayed in sequential positions on said display screen, said numbers being stored in said memory at memory locations which

can be determined in accordance with the displayed position of said cursor on said screen, said method comprising the steps of said operator:

a. positioning said cursor on said screen adjacent the first number of said plurality to be added;

b. positioning and holding one key which has been pre-programmed for a predetermined function to cause said processor to:

(1) add said first number to a number stored in said accumulator to define a subtotal which is stored in said accumulator,



(2) step said cursor to said next number in said sequential positions to cause said system to develop a new said subtotal, and

(3) repeat steps (1) and (2) for each said number in said sequence until said one key is released; and

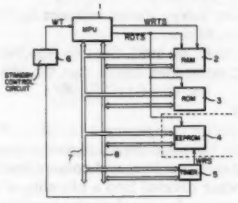
c. releasing said one key when said cursor is moved adjacent to said last number of said plurality in said sequence whereby the typamatic operation of said one key causes said numbers in said sequence to be sequentially added to said accumulator as long as said one key is held depressed.

4,520,458

APPARATUS FOR CONTROLLING WRITING OF DATA INTO A MEMORY HAVING DIFFERENT READ AND WRITE TIMES

Seiichi Hattori, Hachioji, and Kunio Kanda, Kunitachi, both of Japan, assignors to Fanuc Ltd, Minamitsuru, Japan

Filed Apr. 20, 1983, Ser. No. 486,892
Claims priority, application Japan, Apr. 22, 1982, 57-67720
Int. Cl.³ G06F *11/00*
U.S. Cl. 364—900 **3 Claims**



1. An apparatus for controlling the writing of data from a processor into a memory having different read and write times, and connected directly to the processor by address and data buses, the processor generating a timer start command signal when data is to be written into the memory in a current write cycle, comprising:

a timer circuit connected to the memory and to the address and data buses, said timer circuit responsive to the timer start command signal received from the processor via the data bus, for generating a write timing signal which is applied to the memory, and for generating an enable signal, said write timing signal having a duration commensurate with the write time of the memory, so that data from the processor is written into the memory via the data bus within the write time of the memory; and

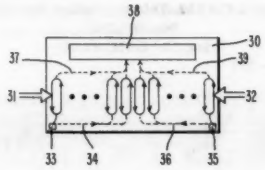
a standby control circuit connected to the processor and to said timer circuit, said standby control circuit responsive to the enable signal from said timer circuit to generate a wait signal for holding the processor in the current write processing cycle long enough for the data from the processor to be written into the memory.

4,520,459

BUBBLE MEMORY WHICH TRANSFERS BUBBLES IN BOTH RIGHT-TO-LEFT AND LEFT-TO-RIGHT SPS LOOPS TO PROVIDE A SHORT ACCESS TIME

Sidney J. Schwartz, deceased, late of Vista, Calif. (by Marie A. Schwartz, executrix), assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 29, 1983, Ser. No. 508,945
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—15 **8 Claims**

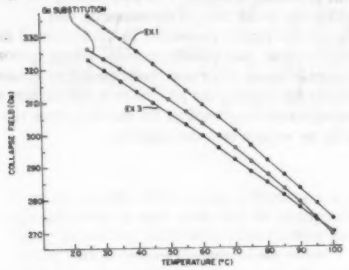


1. A bubble memory comprised of: a substrate with a major surface; a first storage means for storing bubbles on the left side of said surface having parallel inputs and parallel outputs; a second storage means for storing bubbles on the right side of said surface having parallel inputs and parallel outputs; a first input means on the left side of said surface including a serial-parallel track along which said bubbles move to the right immediately before they enter said parallel inputs of said first storage means; a second input means on the right side of said surface including a serial-parallel track along which said bubbles move to the left immediately before they enter said parallel inputs of said second storage means; a means for detecting bubbles disposed equally on the left side and the right side of said surface; a first output means on the left side of said surface including a parallel-serial track which receives bubbles from said parallel outputs of said first storage means and immediately moves them to the right to said detector; and a second output means on the right side of said surface including a parallel-serial track which receives bubbles from said parallel outputs of said second storage means and immediately moves them to the left to said detector.

4,520,460
TEMPERATURE STABLE MAGNETIC BUBBLE COMPOSITIONS

Devlin M. Gualtieri, Ledgewood, and Paul F. Tumelty, Morristown, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Aug. 15, 1983, Ser. No. 523,245
Int. Cl.³ G11C *19/08*; C04B *35/40*
U.S. Cl. 365—33 **5 Claims**



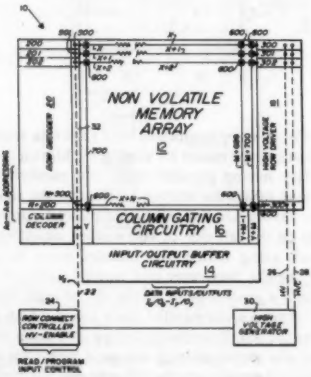
1. An iron garnet layer that is capable of supporting magnetic bubble domains and that has a composition nominally represented by the formula

$$Tm_{0.50}Ca_{0.55}La_{0.05}Sm_{0.79}Lu_{1.56}Fe_{3.57}Ge_{0.48}O_{12.50}.$$

4,520,461
INTEGRATED HIGH VOLTAGE DISTRIBUTION AND CONTROL SYSTEMS

Richard T. Simko, Los Altos, Calif., assignor to Xicor, Inc., Milpitas, Calif.

Continuation-in-part of Ser. No. 230,683, Feb. 2, 1981, which is a continuation-in-part of Ser. No. 6,026, Jan. 24, 1979, Pat. No. 4,314,265, and a continuation-in-part of Ser. No. 6,030, Jan. 24, 1979, Pat. No. 4,274,012. This application Apr. 12, 1982, Ser. No. 367,264
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—184 **12 Claims**

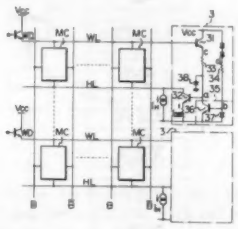


1. An integrated circuit for selectively applying high voltage to circuit elements utilizing such potentials comprising decoding means for charging one or more selected circuit elements nodes of a plurality of nodes to a first electrical potential and for charging other nodes of the plurality of nodes to a second potential, coupling/decoupling means for electrically isolating at least the selected one or more circuit element nodes which have been charged to the first potential, and selective high voltage charging means responsive to the potential on each said selected circuit element node for charging said electrically isolated circuit element nodes at said first potential to an electrical potential greater than the first potential, while preventing the charging of other nodes to such greater potential.

4,520,462
SEMICONDUCTOR MEMORY DEVICE

Katuyuki Yamada, Kawasaki, and Kazuhiro Toyoda, Yokohama, both of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 14, 1982, Ser. No. 449,768
Claims priority, application Japan, Dec. 18, 1981, 56-203364
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **9 Claims**



1. A static-type semiconductor memory device operatively connectable to a power source having a return line, in which a holding current continuously flows from word selection lines through memory cells to hold lines, said static-type semiconductor memory device comprising:

a first transistor, operatively connected to one of the word selection lines, for detecting the potential charge on said one of the word selection lines and for outputting an output signal;

a delay circuit, operatively connected to said first transistor, for delaying the output of said first transistor during a predetermined time and for outputting a delayed output signal;

a second transistor, having a base, operatively connected to said delay circuit and disposed between one of the hold lines and the return line of the power source, said second transistor turned on and off by the delayed output signal of said delay circuit to operate as an electric current switch;

a current mirror circuit operatively connected to the base of said second transistor and having an input; and

a first resistor operatively connected between the input of said current mirror circuit and the return line of the power source.

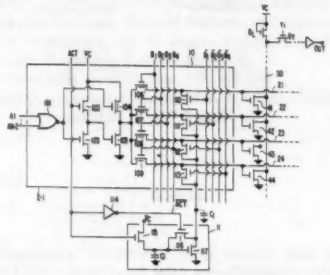
4,520,463
MEMORY CIRCUIT

Kohichiro Okumura, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Oct. 26, 1982, Ser. No. 436,898
Claims priority, application Japan, Oct. 27, 1981, 56-171679
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—189 **11 Claims**

1. A memory circuit comprising a plurality of row lines, a plurality of column lines, a plurality of memory cells arranged at intersections of said row lines and column lines; said plurality of row lines being divided into a plurality of row groups, each of said row groups having the same number of row lines, means for receiving a set of row address signals, a plurality of row group selection circuits each provided for the associated row group, each of said row group selection circuits generating a selection signal when the associated row group is to be selected in accordance with a first part of said row address signals, a plurality of connection circuits each provided for the

associated row group, each of said circuits including a plurality of first field effect transistors each coupled between an output terminal of the row group selection circuit and the associated row line of the associated row group, a potential terminal, a plurality of second field effect transistors each coupled between the associated row line and said potential terminal,



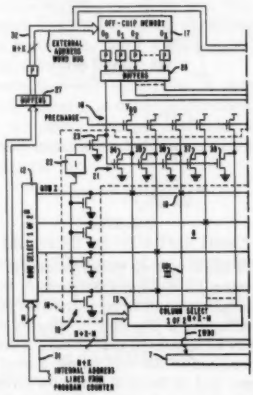
means responsive to a second part of said row address signals for conducting one of said first transistors, and means responsive to the second part of said row address signals for conducting said second transistors other than one associated to the conducted first transistor; and supply means for supplying said potential terminal with a reference potential.

4,520,464

TRANSPARENT INSTRUCTION WORD BUS MEMORY SYSTEM

John J. Hallauer, Colorado Springs, Colo., assignor to NCR Corporation, Dayton, Ohio

Filed Jun. 1, 1982, Ser. No. 383,869
Int. Cl.³ G11C *13/00*
U.S. Cl. 365—189 **9 Claims**



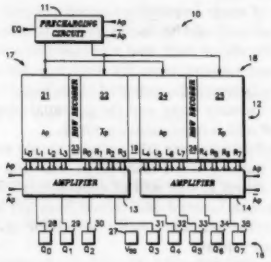
1. A memory system, comprising:
a matrix memory array having a set of row lines and a set of column lines;
a source of instruction word signals;
a source of address word signals;
a row select coupled between the said source of address word signals and the row lines;
a column select coupled between the said source of address word signals and the column lines; and
means for disabling the row select in time coincidence with the transmission of instruction word signals from said source of instruction word signals to the column lines.

4,520,465

METHOD AND APPARATUS FOR SELECTIVELY PRECHARGING COLUMN LINES OF A MEMORY

Lal C. Sood, Austin, Tex., assignor to Motorola, Inc., Schaumberg, Ill.

Filed May 5, 1983, Ser. No. 491,946
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—203 **15 Claims**



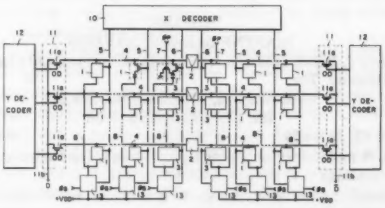
1. A memory array having a plurality of intersecting row lines and column lines in which data bits are output on selected column lines and in which a column line is precharged before an output is read on that column line, wherein the memory array is divided into at least four adjacent side-by-side portions, wherein a first portion is adjacent to a second portion, the second portion is between the first portion and a third portion, and the third portion is between the second portion and a fourth portion; and wherein the column lines of the first and third portions are precharged when a predetermined address signal is in a first logic state and column lines of the second and fourth portions are precharged when the predetermined address signal is in a second logic state.

4,520,466

DYNAMIC RANDOM ACCESS MEMORY

Koichiro Mashiko, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 432,385
Claims priority, application Japan, Oct. 9, 1981, 56-161608
Int. Cl.³ G11C *7/00, 11/40*
U.S. Cl. 365—210 **9 Claims**



1. A dynamic random access memory, comprising:
a first and second memory arrays, each including
a plurality of a word lines (**5**), a plurality of bit lines (**4**), and a single dummy word line (**6**),
a plurality of memory cells (**1**) provided at the intersections between said word lines (**5**) and said bit lines (**4**) for writing therein and reading therefrom the data, said

memory cells (1) coupled to each word line (5) constituting a column of memory cells,

a plurality of dummy cells (3) coupled at the intersections between said dummy word lines (6) and said bit lines (4) for supplying a reference potential, said dummy cells (3) coupled to each said dummy word line (6) constituting a column of dummy cells,

a first cell plate (8) coupled to each of said columns of memory cells (1) for supplying a source voltage ($+V_{DD}$) to said columns, and

a second cell plate (8) coupled to said columns of dummy cells (3) for supplying said source voltage ($+V_{DD}$) to said columns,

a plurality of sense amplifying circuits (2) each coupled to one end of each said bit line (4) in said first memory array and to one end of each said corresponding bit line (4) in said second memory array for detecting and amplifying a difference between the potential of each said bit line (4) of said first memory array and the potential of each said bit line (4) of said second memory array,

word line selecting means (10) coupled to said word lines (5) and said dummy word lines (6) in said first and second memory arrays at one end of each thereof for selecting simultaneously one of said word lines (5) in said first memory array and said dummy word line (6) in said second memory array,

bit line selecting means (11, 12) coupled to said bit lines (4) in said first and second memory arrays for simultaneously selecting one of said bit lines (4) in said first memory array and corresponding one out of said bit lines (4) in said second memory array,

first cell plate voltage control means (13) coupled to the end of each said word line (5) of said first and second memory arrays opposite to the end where said word line selecting means (10) is connected and also coupled to said first cell plate (8) and being supplied with a control signal (ϕ_G) having a level changing in a period when said word line (5) is selected and responsive to selection of the word line (5) for bringing the voltage of said first cell plate (8) to a first level and responsive to the change of the level of said control signal (ϕ_G) for bringing the voltage of said first cell plate (8) to a second level which is different from said first level, and

second cell plate voltage control means (13) coupled to the end of each said dummy word line (6) in said first and second memory array opposite to the end where said word line selecting means (10) is connected and also coupled to said second cell plate (8) and being supplied with said control signal (ϕG) and for controlling the voltage of said second cell plate (8) at the same timing in the same manner as the voltage level of said first cell plate (8) is controlled.

4,520,467

MARINE SEISMIC SYSTEM

Albert J. Berni, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Mar. 18, 1982, Ser. No. 359,322

Int. Cl.³ G01V *1/36, 1/38*

U.S. Cl. 367—24 **8 Claims**

1. A method for obtaining a ghost-free marine seismic signal, comprising:

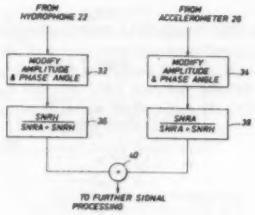
supplying acoustic energy to a body of water above substrata to be seismically explored;

detecting reflected seismic signals indicative of said substrata and corresponding ghost signals from the air-water interface with pressure sensors and with motion sensors;

filtering each of said detected seismic and corresponding ghost signals to produce band-limited spike waveforms having arrival times intermediate the arrival times of said seismic and ghost signals as a function of the depth of detection of said signals;

determining the signal-to-noise ratio for said pressure sensors and for said motion sensors;

filtering said spike waveforms with zero phase filters having a band-limited frequency dependent amplitude spectrum functionally related to the signal-to-noise ratios for said sensors; and



adding said filtered spike waveforms from said pressure sensors to said filtered spike waveforms from said motion sensors to form a filtered spike waveform having a maximum signal-to-noise ratio for each frequency component therein.

4,520,468

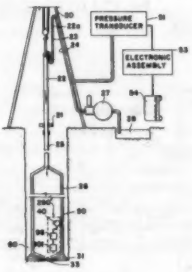
BOREHOLE MEASUREMENT WHILE DRILLING SYSTEMS AND METHODS

Serge A. Scherbatskoy, 1100 Everman Rd., Fort Worth, Tex. 76101

Continuation of Ser. No. 68,526, Aug. 21, 1979, abandoned, which is a continuation-in-part of Ser. No. 857,677, Dec. 5, 1977, abandoned. This application May 28, 1982, Ser. No. 383,269

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—83 **7 Claims**



1. Apparatus for use in making measurements in conjunction with a drilling system for drilling a borehole in the earth, the drilling system including a drill string suspended in a borehole, the drill string including a plurality of lengths of drill pipe some of which may be lengths of drill collars, a drilling means affixed to the lower end of the drill string, a mud pump connected to the upper end of the drill string for circulating drilling fluid therethrough, the apparatus comprising sensor means and instrumentation means for generating electric signals representative of the magnitude of one or more downhole parameters, pulser means for producing pressure pulses in the drilling fluid in response to the electric signals received from said instrumentation means, a pulser sub threadably secured at its upper and lower ends to length of drill pipe in the drill string, said pulser means being mounted within said pulser sub, an elongated housing supported by said pulser sub, said housing having an outside diameter less than the internal diameter of the adjacent drill pipe and being slideably received in the drill pipe adjacent in the drill string to said pulser sub, said pulser

and said housing permitting the flow of drilling fluid therepast, said housing containing at least a portion of said instrumentation means.

4,520,469

TRACKING SERVO SYSTEM FOR OPTICAL-DISC INFORMATION REPRODUCING APPARATUS

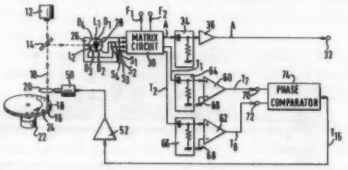
Shigeru Todokoro, Fujisawa; Hiroshi Nakane, and Satoru Maeda, both of Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Mar. 3, 1983, Ser. No. 471,648

Claims priority, application Japan, Mar. 3, 1982, 57-33327

Int. Cl.³ G11B *7/00*

U.S. Cl. 369—44 **8 Claims**



1. A tracking servo system for an optical-disc information reproducing apparatus in which information stored in an optical disc as a series of recesses arranged in predetermined tracks is scanned by a light beam defining a convergent spot on the optical-disc, said system comprising:

a light source for generating the light beam used for scanning a target track of the predetermined tracks of the optical-disc;

first and second photodetecting means for converting an image corresponding to said convergent spot on said target track into first and second electric signals, respectively, said image being formed by reflection of the light beam from the optical-disc;

means for comparing the phases of said first and second electric signals and for producing a tracking error signal varying in accordance with a difference between the phases of said electric signals; and

means for deflecting said light beam in response to said tracking error signal so as to move said convergent spot in a path on the optical-disc perpendicular to said target track, thereby causing the light beam to scan said target track accurately.

4,520,470

CLEANING DEVICE FOR DISCS

Stephane d'Alayer de Costemore d'Arc, Brussels, Belgium, assignor to Staar S. A., Brussels, Belgium

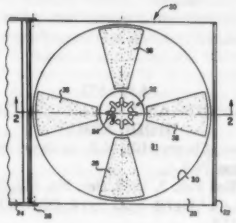
Filed Aug. 8, 1983, Ser. No. 521,260

Claims priority, application Belgium, Nov. 29, 1982, 0/209.596; Apr. 7, 1983, 0/210.503

Int. Cl.³ F11B *3/58*

U.S. Cl. 369—72 **21 Claims**

1. A cleaning device for discs or records having a center hole comprising, in combination, a disc storage container including a pair of box-halves providing a bottom section and a lid section, a support carried by and providing a support surface within said bottom section of said storage container, a cleaning member on said support surface within said bottom section adapted to engage the face of a disc placed on said cleaning member, and means carried by said bottom section of said storage container comprising a mandrel for engaging the periphery of the center hole of a disc placed on said member, said support and said mandrel being carried within said bottom section of said container for relative rotational movement, and said mandrel providing means for holding said disc in contact with said cleaning member while said disc and cleaning member are rotated relative to one another for cleaning the entire face of the disc by said cleaning member.



4,520,471

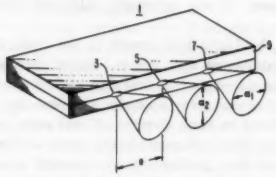
MULTI-CHANNEL RECORDING/PLAYBACK OPTICS FOR LASER DIODE ARRAYS

Donald B. Carlin, Robbinsville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 7, 1983, Ser. No. 464,559

Int. Cl.³ G11B *7/00, 7/14;* **G02B** *13/08*

U.S. Cl. 369—112 **7 Claims**



1. An optical system for processing information on the surface of a record medium, comprising:

an array of solid state elements emitting respective coherent light beams having generally elliptical cross-sectional shapes;

a first spherical lens, having a focal length f_1, for collecting said respective coherent light beams emitted by said array of solid state elements, said first spherical lens having a flat field over the extent of said array such that said first spherical lens collects the light emitted by each element of said array and forming said respective coherent light beams into collimated light beams, said first spherical lens being positioned at a one focal length distance, f_1, from said array of solid state elements;

a beam expander for anamorphically expanding said collimated light beams to reshape the cross-section thereof such that the cross-section is generally circular, said beam expander including a first cylindrical lens having a focal length f_2 and a second cylindrical lens having a focal length f_3, said first cylindrical lens being positioned from said first spherical lens by a distance equal to the sum of their respective focal lengths, f_1+f_2, and said second cylindrical lens being positioned from said first cylindrical lens by a distance equal to the sum of their respective focal lengths, f_2+f_3;

a second spherical lens, having a focal length f_4, for focusing said collimated light beams as respective diffraction limited spots onto said surface of said record medium, said second spherical lens being positioned from said second cylindrical lens by a distance equal to the focal length, f_3, of said second cylindrical lens and being positioned from

said record medium surface by a distance equal to the focal length of said second spherical lens, f_4; and

means for providing relative motion between said second spherical lens and said record medium surface for maintaining said collimated beams focused as respective diffraction limited spots on said record medium surface.

4,520,472

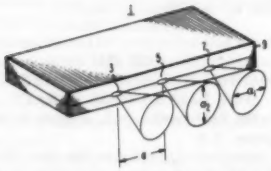
BEAM EXPANSION AND RELAY OPTICS FOR LASER DIODE ARRAY

Charles W. Reno, Cherry Hill, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Feb. 7, 1983, Ser. No. 464,658

Int. Cl.³ G11B *7/00, 7/14;* **G02B** *13/08*

U.S. Cl. 369—112 **13 Claims**



1. An optical system for transducing information on the surface of a record medium, comprising:

an array of solid state elements emitting respective coherent light beams having generally elliptical cross-sectional shapes;

a first lens, having a focal length f_1, for collecting said respective coherent light beams emitted by said array of solid state elements, said first lens having a flat field over the extent of said array such that said first lens collects the light emitted by each element of said array and forming said respective coherent beams into collimated light beams, said first lens having an exit pupil at a distance f_1 from a principal plane of said first lens from which said collimated light beams diverge;

a beam expander for anamorphically expanding said collimated light beams to reshape the cross-section of said collimated light beams such that the cross-sectional shape of said collimated light beams is generally circular;

a lens system for focusing said collimated light beams as a diffraction limited spots on said surface of said record medium, said lens system having a finite conjugate and an entrance pupil from which said collimated beams are focused on said surface of said record medium; and

a second lens for relaying said exit pupil of said first lens into said entrance pupil of said lens system, said second lens forming an image of said array of solid state elements in the finite conjugate plane of said lens system.

4,520,473

SIGNAL PICKUP DEVICE IN A ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Hiroyuki Sugiyama, Isehara; Ryozo Abe, Yokohama; Yasuhiro Yusa, Fujisawa; Masaki Sakurai, Yokohama, and Kenji Yoshihara, Chiba, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Nov. 17, 1981, Ser. No. 322,382

Claims priority, application Japan, Nov. 21, 1980, 55-167203[U]

Int. Cl.³ G11B *9/00, 3/10, 21/24*

U.S. Cl. 369—126 **5 Claims**

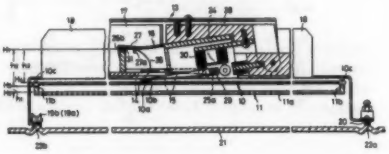
1. A signal pickup device in a rotary recording medium reproducing apparatus comprising:

a turntable for placement thereon of a rotary recording medium recorded with an information signal as variations in geometrical configuration, for rotating the rotary recording medium;

a cartridge including a cantilever having a tip end with a reproducing stylus at said tip end for making contact with and sliding against a recorded region of said rotary recording medium upon reproduction to reproduce the information signal;

a resonator having a resonance frequency which varies in accordance with the above variations in geometrical configuration;

a conductive ribbon having one end connected to said reproducing stylus and the other end connected to said resonator to electrically connect an electrode of said reproducing stylus with said resonator, said conductive ribbon being in a curved and bent state upon reproduction of said rotary recording medium, and



means for restricting said cartridge at a predetermined height position at the location where the other end of said conductive ribbon is electrically connected to said resonator,

said conductive ribbon having a length such that said conductive ribbon is put into an extended state from said curved and bent state when said reproducing stylus is lowered below the height position of said rotary recording medium, to restrict the lowering of said reproducing stylus at a height position higher than that of said turntable,

said turntable comprising a projecting wall for supporting an outer peripheral groove guard of said rotary recording medium at an outer periphery thereof, and a circular plate part opposing the recorded region of said rotary recording medium, said circular plate part having an upper surface which is lower than a vertex plane of said projecting wall.

4,520,474

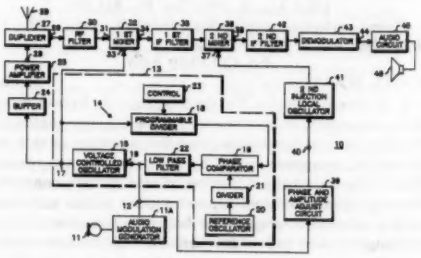
DUPLEX COMMUNICATION TRANSCEIVER WITH MODULATION CANCELLATION

Richard J. Vilmur, Palatine, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1983, Ser. No. 558,685

Int. Cl.³ H04B *3/20;* **H04L** *5/14*

U.S. Cl. 370—24 **10 Claims**



1. A duplex communication transceiver comprising:

transmitter means for providing for information transmission

an output signal comprising a first carrier signal having a first predetermined frequency and modulated by a first information signal;

receiver means, coupled to and simultaneously operable with said transmitter means, for receiving an input signal comprising a second carrier signal having a second predetermined frequency different from said first frequency and modulated by a second information signal different from said first information signal, said receiver means effectively demodulating said input signal and providing said second information signal in response thereto;

said receiver means including;

a first mixer means coupled to said transmitter means for receiving said modulated first and second carrier signals and for providing, in response thereto, a first IF signal modulated with said first and second information signals, said first IF signal having an IF frequency comprising an arithmetic combination of the frequencies of said first and second carrier signals,

a first IF means fixed tuned to said IF frequency and coupled to said first mixer means for receiving and passing said first IF signal and rejecting signals at substantially different frequencies,

a second mixer means coupled to said first IF means for receiving said passed modulated first IF signal therefrom and also receiving, from a local oscillator means, a local oscillator carrier signal having a predetermined local oscillator frequency and modulated by a signal related to said first information signal, and for providing in response thereto a modulated second IF signal having a second IF frequency comprising the arithmetic combination of said first IF frequency and said local oscillator frequency,

signal adjustment means coupled to said transmitter means and said local oscillator means for receiving said first information signal from said transmitter means and adjusting it to provide said modulating related signal such that said second mixer means cancels said first information signal modulation contained in said first IF signal so that said second IF signal substantially comprises a carrier signal at said second IF frequency modulated by just said second information signal, and

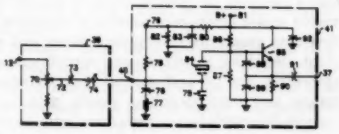
demodulator means coupled to said second mixer means for receiving said modulated second IF signal and providing said second information signal in response thereto.

4,520,475

DUPLEX COMMUNICATION TRANSCEIVER WITH MODULATION CANCELLATION

Daniel T. Berg, Elgin, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 5, 1983, Ser. No. 558,739
Int. Cl.³ H04B *3/20*; H04L *5/14*
U.S. Cl. 370—24 **5 Claims**



1. A duplex communication transceiver comprising:

transmitter means for providing for information transmission an output signal comprising a first carrier signal having a first predetermined frequency and modulated by a first information signal;

receiver means, coupled to and simultaneously operable with said transmitter means, for receiving an input signal comprising a second carrier signal having a second predetermined frequency different from said first frequency and modulated by a second information signal different from said first information signal, said receiver means effectively demodulating said input signal and providing said second information signal in response thereto;

said receiver means including;

a first mixer means coupled to said transmitter means for receiving said modulated first and second carrier signals and for providing, in response thereto, a first IF signal modulated with said first and second information signals, said first IF signal having an IF frequency comprising an arithmetic combination of the frequencies of said first and second carrier signals,

a first IF means fixed tuned to said IF frequency and coupled to said first mixer means for receiving and passing said first IF signal and rejecting signals at substantially different frequencies,

a second mixer means coupled to said first IF means for receiving said passed modulated first IF signal therefrom and also receiving, from a local oscillator means, a local oscillator carrier signal having a predetermined local oscillator frequency and modulated by a signal related to said first information signal, and for providing in response thereto a modulated second IF signal having a second IF frequency comprising the arithmetic combination of said first IF frequency and said local oscillator frequency,

signal adjustment means coupled to said transmitter means and said local oscillator means for receiving said first information signal from said transmitter means and adjusting it to provide said modulating related signal such that said second mixer means cancels said first information signal modulation contained in said first IF signal so that said second IF signal substantially comprises a carrier signal at said second IF frequency modulated by just said second information signal, and

demodulator means coupled to said second mixer means for receiving said modulated second IF signal and providing said second information signal in response thereto,

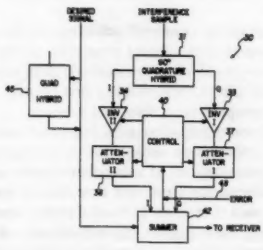
wherein the improvement comprises, said receiver means including a voltage controlled oscillator for providing said modulated local oscillator carrier signal wherein said oscillator includes a reactance element determining the frequency of said local oscillator carrier signal, and wherein said signal adjustment means comprises a selectable predetermined resistance element coupled between said first information signal and said reactance element wherein said resistance and reactance elements together provide a predetermined phase shift for said first information signal to provide said desired related signal.

4,520,476

APPARATUS FOR ENABLING THE DUPLEX OPERATION OF A TRANSMITTER AND RECEIVER

Eugene P. Searl, Dallas, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 13, 1982, Ser. No. 449,055
Int. Cl.³ H04B *1/56*
U.S. Cl. 370—32 **6 Claims**



1. Apparatus for enabling full duplex operation of co-located transmitter and receiver on the same frequency, comprising:

means for deriving a sample of a transmit signal generated by the transmitter,

means for deriving a sample of a receive signal which is to be applied to the receiver, and

an adaptive combiner comprising a 90 degree quadrature hybrid, responsive to said transmit signal sample, to produce I and Q signals, first and second inverters to selectively invert said I and Q signals, respectively, first and second attenuators to controllably attenuate said respective I and Q signals, and a summer to sum said selectively inverted and attenuated I and Q signals with the receive signal sample, whereby portions of the receive signal sample representing the signal generated by the transmitter are cancelled.

4,520,477

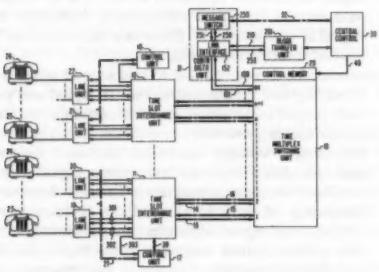
CONTROL INFORMATION COMMUNICATION ARRANGEMENT FOR A TIME DIVISION SWITCHING SYSTEM

Wilson K. Wen, Middletown, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Jun. 27, 1983, Ser. No. 507,779

Int. Cl.³ H04Q *11/04*

U.S. Cl. 370—58 **9 Claims**



1. A time division switching system comprising

a time-shared space division switch comprising input and output ports for completing communication paths between selected ones of said input ports and said output ports in time-slots of fixed duration;

a plurality of communication units each connected to a plurality of signal generating subscriber stations and each communication unit being connected to predetermined ones of said input and output ports for transmitting and receiving digitized representations of subscriber station signals in predetermined ones of said time-slots of fixed duration;

control information communication means for preempting predetermined ones of said time-slots of fixed duration from conveying digital representations of subscriber station signals and for transmitting first control information in said preempted time-slots; and wherein

each of said communication units comprises control means, time-slot interchange means for receiving and storing digital representations of subscriber signals and said first control information from said time-shared space division switch in said time-slots of fixed duration and means for transmitting said digital representations of subscriber station signals from said time-slot interchange means to said subscriber stations and means for transmitting said first control information from said time-slot interchange means to said control unit.

4,520,478

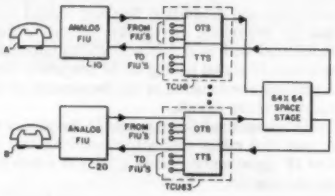
SPACE STAGE ARRANGEMENT FOR A T-S-T DIGITAL SWITCHING SYSTEM

Nathaniel Simmons, Downers Grove, Ill.; Sergio E. Puccini, Scottsdale, Ariz.; Stig E. Magnusson, and Kamal I. Parikh, both of Phoenix, Ariz., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 22, 1983, Ser. No. 506,563

Int. Cl.³ H04J *11/04*

U.S. Cl. 370—63 **6 Claims**



1. In a time-space-time network including a first time group having a plurality of originating time stages and a plurality of terminating time stages and a second time group having a plurality of originating time stages and a plurality of terminating time stages, a space stage comprising:

first switching matrix means including a plurality of inputs and a plurality of outputs, each of said first switching matrix means inputs connected to a respective one of said first time group originating time stages and each of said plurality of first switching matrix means outputs connected to a respective one of said first time group terminating time stages, said first switching matrix means arranged to provide selectable interconnections between said originating time stages and said terminating time stages of said first group;

second switching matrix means including a plurality of inputs and a plurality of outputs, each of said second switching matrix means inputs connected to a respective one of said second time group originating time stages and each of said second switching matrix means outputs connected to a respective one of said second time group terminating time stages, said second switching matrix means arranged to provide selectable interconnections between said originating time stages and said terminating time stages of said second group;

third switching matrix means including a plurality of inputs and a plurality of outputs, each of said third switching matrix means inputs connected to a respective one of said first time group originating time stages and each of said third switching matrix means outputs connected to a respective one of said second group terminating time stages, said third switching matrix means arranged to provide selectable interconnections between said originating time stages of said first time group and said terminating time stages of said second time group; and

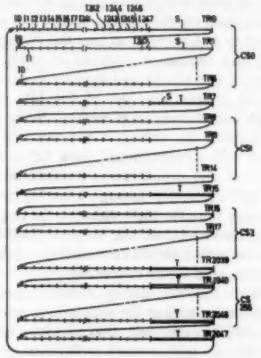
fourth switching matrix means including a plurality of inputs and a plurality of outputs, each of said fourth switching matrix means inputs connected to a respective one of said second time group originating time stages and each of said fourth switching matrix means outputs connected to a respective one of said first time group terminating time stages, said fourth switching matrix means arranged to provide selectable interconnections between said originating time stages of said second time group and said terminating time stages of said first time group.

4,520,479

ARRANGEMENT FOR RE-ARRANGING INFORMATION FOR TRANSMITTING OUTGOING TIME-DIVISION MULTIPLEXED INFORMATION OBTAINED FROM INCOMING TIME-DIVISION MULTIPLEXED INFORMATION

Jean-Claude Grima, Chatillon; Bernard Pando, Versailles, and Guy A. J. David, Thiais, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 4, 1983, Ser. No. 491,508
Claims priority, application France, May 5, 1982, 82 07788
Int. Cl.[3] H04J *3/16;* H04Q *11/04*
U.S. Cl. 370—84 3 Claims



1. Apparatus for transmitting outgoing time division multiplexed information obtained from incoming time division multiplexed information, said time division multiplexed information being arranged to form recurring multiframes, each of said multiframes having a plurality of frames, each of said frames having a plurality of message time slots and a lesser plurality of nonmessage time slots, a fast rate channel being constituted by corresponding message time slot in each of said frames, a slow rate channel being constituted by corresponding nonmessage time slots in a multiplicity of consecutive frames less in number than said plurality of frames, said apparatus comprising:

a plurality of memory sets, each of said sets having a plurality of memory locations equal in number to the total number of time slots in one of said frames;

write means for writing message bits and nonmessage bits from said incoming message and nonmessage time slots associated with one of said frames into corresponding memory locations in one of said memory sets;

read circuit means for subsequently reading so stored message and nonmessage bits from said memory set, said read out means having a read output terminal for furnishing so-read out bits;

delay means having a delay input connected to said output terminal of said read circuit means and a delay output terminal, for delaying slow channel bits furnished at said read output terminal for a predetermined time period and furnishing so-delayed slow channel bits at said delay output terminal;

combining means having a first input connected to said delay output terminal, a second input, a control input, and a combining output for furnishing said outgoing multiplexed information;

means directly connecting said read output terminal to said second input of said combining means; and

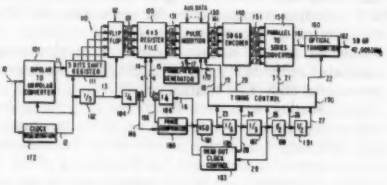
control means connected to said combining means for connecting said delay output to said combining output during nonmessage time slots of said outgoing multiplexed information, and to said second input during message time slots of said outgoing multiplexed information.

4,520,480

DIGITAL TRANSMISSION SYSTEM

Kiyoaki Kawai, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 16, 1983, Ser. No. 495,230
Claims priority, application Japan, May 18, 1982, 57/84486
Int. Cl.[3] H04J *3/06, 3/12*
U.S. Cl. 370—100 9 Claims



1. A digital transmission system adapted to a time division multiplex system comprising:

means for converting a serial input data bit stream into parallel n bit streams;

means for converting the bit rate of the parallel n bit streams to produce bit rate converted parallel n bit streams to produce an additional time slot in each of said parallel n bit streams per every predetermined number of data bits;

means for inserting service bits in the additional time slots of respective ones of the bit rate converted parallel n bit streams to produce parallel n service-bit-inserted bit streams at the converted bit rate, said service bits including framing bits which appear for every preselected number of bits in each of said n bit streams;

means for converting mutually corresponding parallel n-bits of the parallel n service-bit-inserted bit streams into parallel m-bits to produce parallel m bit streams; and

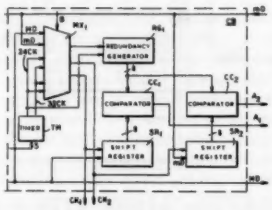
means for multiplexing the parallel m bit streams into a signal output bit stream having a framing-bit pattern made-up of m bits which correspond to m framing bits taken out in the same timing of the n service-bit-inserted bit streams.

4,520,481

DATA-HANDLING SYSTEM FOR THE EXCHANGE OF DIGITAL MESSAGES BETWEEN TWO INTERCOMMUNICATING FUNCTIONAL UNITS

John W. Israel, Dallas, Tex., assignor to Italtel—Societa Italiana Telecomunicazioni S.P.A., Milan, Italy

Filed Sep. 13, 1982, Ser. No. 417,370
Int. Cl.[3] G06F *11/10*
U.S. Cl. 371—37 7 Claims



1. In a data-handling system including a first functional unit and a second functional unit each provided with a transmitting section for emitting digital messages to the other functional unit and a receiving section for accepting digital messages emitted by the other functional unit, each digital message

consisting of a predetermined number of k information bits followed by a predetermined number of h cyclic redundancy bits where h is an aliquot fraction of k,

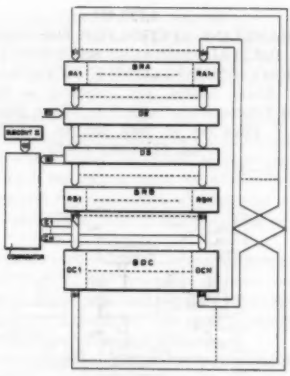
the combination therewith of a control unit interposed in a signal path linking said functional units with each other, said signal path having a first line for the transmission of messages from said first functional unit to said second functional unit and a second line for the transmission of messages from said second functional unit to said first functional unit, the receiving section of each functional unit including storage means for registering the information bits of an incoming message and algebraic means connected to said storage means for recalculating the associated redundancy bits according to a predetermined polynomial code, said control unit including timing means communicating with each functional unit for activating said storage means of a message-receiving functional unit and switching said algebraic means to the transmitting section thereof to command the forwarding of the recalculated redundancy bits to said control unit via the respective line of said signal path, said control unit further comprising a redundancy generator coupled with said signal path for recalculating the redundancy bits of a throughgoing message from the information bits thereof, first comparison means connected to receive the locally recalculated redundancy bits from said generator concurrently with redundancy bits arriving from said first functional unit over said first line for emitting a first alarm signal upon detecting a discrepancy therebetween, and second comparison means connected to receive the locally recalculated redundancy bits from said generator concurrently with redundancy bits arriving from said second functional unit over said second line for emitting a second alarm signal upon detecting a discrepancy therebetween.

4,520,482

SAFETY CONTROLLER

Rémy Fourré, Les Ulis, and Bruno de Langre, Paris, both of France, assignors to Societe d'Etudes Et Conseils A E R O, France

Filed Sep. 10, 1982, Ser. No. 416,620
Claims priority, application France, Sep. 14, 1981, 81 17338
Int. Cl.³ G06F *11/16*
U.S. Cl. 371—68 **4 Claims**



1. A controller of the type including a pair of sub-controllers and a comparator facility operating on outputs from the two subcontrollers, said controller comprising, in combination:

(I) a pair of said subcontrollers, each of said sub-controllers being identical when containing no faults and comprising:

(1) at least two blocks of parallel registers;

(2) at least one block of parallel combinational units for providing predetermined operations on signals transmitted to the inputs of said combinational units;

(3) an output device for providing an output signal;

(4) an input device, (a) having an input for receiving an input signal to said subcontroller and (b) coupled between the output of one of said blocks and devices and the input of another one of said blocks and devices, for selectively transmitting (i) the signal as received from said output of said one of said blocks and devices, unmodified by said input signal, to said input of said another one of said blocks and devices, and (ii) the signal received from said output of said one of said blocks and devices, modified by said input signal, to said input of said another one of said blocks and devices;

wherein (a) said blocks and devices of said subcontroller are coupled to one another so that the output of each of said blocks and devices is coupled in series to the input of another of said blocks and devices so as to form a shifting loop, (b) at least one set of test bits moves cyclically through said shifting loop, without being modified by said input signals, the values of the test bits being modified only by said combinational units, (c) said test bits dynamize all of said registers and combinational units successively and cyclically through a testing cycle so as to provide every possible logic value at the respective inputs of said registers and units and output signals from said output device such that a no-fault condition of said sub-controllers is indicated when output signals of said two sub-controllers are identical during a testing cycle; and

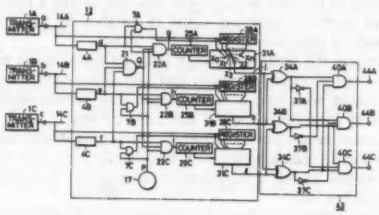
(II) comparator means for comparing said output signals from said subcontrollers so as to detect differences in said output signals representative of faults in one of said subcontrollers.

4,520,483

SIGNAL DIAGNOSTIC METHOD AND APPARATUS FOR MULTIPLE TRANSMISSION SYSTEM

Setsuo Arita, and Tetsuo Ito, both of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,375
Claims priority, application Japan, Sep. 28, 1981, 56-152211
Int. Cl.³ H04M *3/22*
U.S. Cl. 371—68 **9 Claims**



1. In a signal diagnostic apparatus for a multiple transmission system having first, second and third transmission means arranged in parallel to transmit transmission signals each having a synchronizing signal part and an information signal part; first, second and third reception means to receive the transmission signals provided from the first, second and third transmission means, respectively; and means to detect any error of the transmission signals by receiving the respective transmission signals provided from the first, second and third transmission means; a signal diagnostic apparatus for a multiple transmission system characterized by comprising means to receive said respective transmission signals provided from said first, second and third transmission means and to detect the transmission signal transmitted latest among these transmission signals; first means to detect the transmission time difference between said

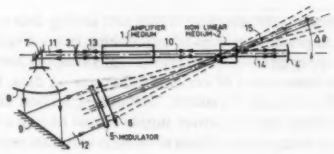
transmission signal provided from said first transmission means and said transmission signal transmitted latest; second means to detect the transmission time difference between said transmission signal provided from said second transmission means and said transmission signal transmitted latest; third means to detect the transmission time difference between said transmission signal provided from said third transmission means and said transmission signal transmitted latest; first means to delay said transmission signal provided from said first transmission means, on the basis of an output signal from the first transmission time difference detecting means; second means to delay said transmission signal provided from said second transmission means, on the basis of an output signal from the second transmission time difference detecting means; and third means to delay said transmission signal provided from said third transmission means, on the basis of an output signal from the third transmission time difference detecting means; the error detection means detecting the error by comparing said respective transmission signals provided from the first, second and third delay means.

4,520,484

COHERENT RADIATION SOURCE GENERATING A BEAM WITH A REGULATABLE PROPAGATION DIRECTION

Jean-Pierre Huignard, and Marcel Malard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed May 17, 1982, Ser. No. 379,048
Claims priority, application France, May 22, 1981, 81 10248
Int. Cl.³ H01S *3/101*
U.S. Cl. 372—24 **9 Claims**



1. A coherent radiation source producing a beam having a regulatable propagation direction, comprising:

a laser cavity defined by an amplifying medium positioned between first and second spherical mirrors and pumping means to permit generation of an oscillation wave in said cavity, said first mirror having a non-zero transmission coefficient to transmit a fraction of said oscillation wave; and

deflection means for providing said beam, comprising:

(a) an interaction medium placed within the cavity between said amplifying medium and said second mirror to tap an amount of said oscillation wave and to provide an output deflected laser beam in a desired direction upon reception of a signal wave, the center of curvature of said first and second mirrors coinciding and being located within said interaction medium; and

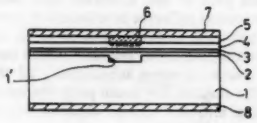
(b) means for generating said signal wave including means for deriving said fraction of said oscillation wave to illuminate the area of a selection matrix of X-Y modulating means, said matrix being X-Y controlled to provide a corresponding X-Y transparent window, and optical means to transmit said derived oscillation wave which passes through said selected window towards said center of curvature to constitute said signal wave, the direction of the output deflected beam being a function of the angle of incidence of said signal wave determined by the X-Y position of said selected window.

4,520,485

SEMICONDUCTOR DEVICE

Takashi Sugino, Takatsuki; Kunio Itoh, Uji; Masaru Wada, Takatsuki, and Hirokazu Shimizu, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Mar. 11, 1982, Ser. No. 357,086
Claims priority, application Japan, Mar. 17, 1981, 56-38957; Feb. 5, 1982, 57-17813
Int. Cl.³ H01S *3/19*; G02B *5/174*
U.S. Cl. 372—48 **7 Claims**



1. In a semiconductor device the improvement comprising:

a semiconductor substrate having a groove with widths differing at both ends on a principal surface, and

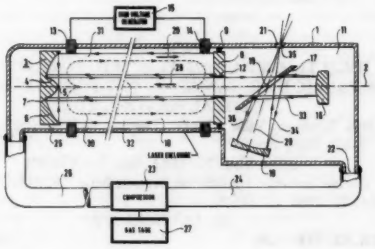
a semiconductor crystal layer which is to serve as a waveguide and formed on all of said principal surface filling said groove.

4,520,486

GAS FLOW LASER OSCILLATOR

Bernard Lavarini, Jouy en Josas, France, assignor to Compagnie General D'Electricite, Paris, France

Filed Jul. 28, 1983, Ser. No. 518,267
Claims priority, application France, Jul. 30, 1982, 82 13322
Int. Cl.³ H01S *3/08*
U.S. Cl. 372—95 **6 Claims**



1. A gas flow laser oscillator comprising:

an elongate enclosure having an axis;

a first reflector disposed at one end of the inside of said enclosure;

a second reflector disposed inside the enclosure facing opposite the first reflector, the edges of the second reflector being fixed in a sealed manner to the walls of the enclosure to form therein a first chamber between the first and the second reflectors and a second chamber between the second reflector and the other end of the enclosure, the second reflector including an opening putting the first and second chambers into communication with each other;

means for inserting a laser active gas into the second chamber, the gas passing through the opening in the second reflector, the cross section of the opening and pressure of the gas being chosen to form turbulant flow in the first chamber;

means for extracting the gas from the first chamber; and

two electrodes disposed in the first chamber and connected to a source of electric current for establishing an electric discharge in the active gas in such a manner as to generate

a coherent light beam which is reflected on the first and second reflectors;

the improvement wherein:

the first reflector comprises first and second substantially conical reflecting surfaces, said surfaces being coaxial with said axis and oppositely inclined relative to a plane normal thereto, with the first conical reflecting surface being in the center of the first reflector and being immediately surrounded by the second conical reflecting surface, the second reflector being plane and centered on said axis, said opening being axial in such a manner that an annular first beam path of said coherent light radiation coming from the second reflector is reflected in succession on said second and first conical surfaces so as to constitute a second beam path about said axis which beam is cylindrical and which occupies substantially all the volume left free by the annular first beam path, the second beam path penetrating into said second chamber via the opening in said second reflector;

and wherein the oscillator further comprises:

a convex third reflector centered on the axis, and disposed in the second chamber in such a manner as to reflect the cylindrical second beam path along a divergent co-axial third beam path; and

a plane fourth reflector disposed on the axis between the second and third reflectors, said fourth reflector being provided with a central apperture and being inclined relative to a plane normal to the axis so that firstly; the second bearing path and an axial portion of the third beam path passes through the apperture; and secondly the remaining peripheral portion of the third beam path is reflected by the fouth reflector along a fourth beam path;

the first, second, third, and fourth reflectors constituting an unstable resonant cavity capable of amplifying coherent light radiation, a concave fifth reflector disposed to concentrate the energy of the laser radiation along a fifth beam path to a point on said enclosure means such that the laser radiation escapes.

4,520,487

HIGH TEMPERATURE ELECTRIC FURNACE WITH METALLIC RESISTANCES IN THE FORM OF HOLLOW VERTICAL HEATING TUBES

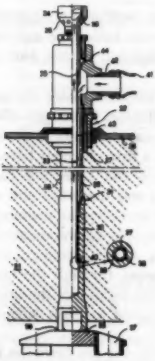
Louis Graniou, Villa Maeva, Chemin de l'Archet Superieur, 06200 Nice, France

Filed Mar. 10, 1983, Ser. No. 473,998

Claims priority, application France, Mar. 10, 1982, 82 04281; Jan. 31, 1983, 83 01585

Int. Cl.³ H65B *3/40*

U.S. Cl. 373—134 **10 Claims**



1. A high temperature electric furnace having electric resistances therein which are vertical hollow heating tubes, electrically conductive bridge plates interconnecting the upper ends of each adjacent pair of tubes, electrically conductive bridge plates interconnecting the lower ends of each adjacent pair of tubes so as to complete a sinuous electrical path along the tubes, and hangers secured to the upper bridge plates and suspending the tubes within the furnace, each of said bridge plates being an obtuse angled dihedral whose obtuse angle opens toward the tubes to which it is connected.

4,520,488

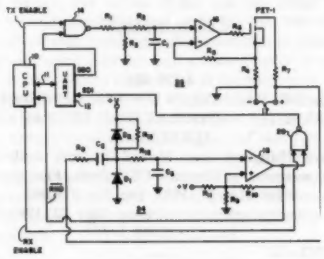
COMMUNICATION SYSTEM AND METHOD

Felix J. Houvig, Wayne, and Ronald H. Rowlands, Collegeville, both of Pa., assignors to Honeywell, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 239,244, Mar. 2, 1981, abandoned. This application Nov. 2, 1981, Ser. No. 317,083

Int. Cl.³ H04B *3/60*

U.S. Cl. 375—5 **20 Claims**



9. A method for alternate digital and analog data communication comprising the steps of introducing into a direct current power supply circuit first direct current variations having peak values representative of corresponding analog data, terminating the first current variations, introducing second direct current variations into the power supply circuit having a variation between pre-set current limits with each variation representing a digital bit, and terminating the second current variations by introducing a pre-set gap represented by a fixed pre-set current level.

4,520,489

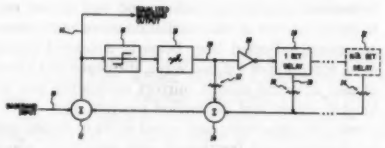
DECISION FEEDBACK EQUALIZING APPARATUS

Charles R. Hogge, Jr., Richardson, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 15, 1983, Ser. No. 523,203

Int. Cl.³ H04B *3/08*

U.S. Cl. 375—14 **7 Claims**



5. The method of equalizing a digital pulse bit stream signal comprising the steps of:

decision detecting logic level of bits in a bit stream first signal to generate a logic level second signal;

filterlessly time delaying said second signal by a time equivalent to the time between the commencement of adjacent data bits to produce a third signal whose rise and fall times are very short as compared to the time of the time delay;

combining said second and third signals to produce a feedback fourth signal; and

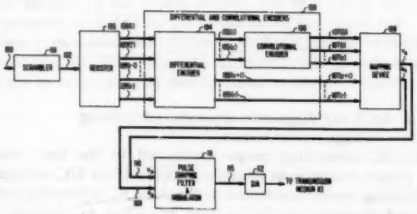
logically combining said fourth signal with a signal to be equalized to produce said first signal wherein the logically combined fourth signal includes positive feedback components of said second signal relative said first signal.

4,520,490

DIFFERENTIALLY NONLINEAR CONVOLUTIONAL CHANNEL CODING WITH EXPANDED SET OF SIGNALLING ALPHABETS

Lee-Fang Wei, Matawan, N.J., assignor to AT&T Information Systems Inc., Holmdel, N.J.

Filed Aug. 5, 1983, Ser. No. 520,691
Int. Cl.³ H04L *1/10, 5/12*
U.S. Cl. 375—27 **18 Claims**



15. A method for transmitting a bit sequence by modulating a carrier signal to sequentially assume one of a plurality of pairs of discrete signal values, comprising the steps of:

(a) expanding each current bit group into a group of r+1 bits by a finite state non-linear convolutional coding process utilizing p stored bits, the current values of said p stored bits affecting the current output of said convolutional encoder and being determined by both the previous r bit group input to said convolutional encoder and previous values of said p stored bits,

(b) selecting one of 2^{r+1} signalling alphabets from a signal constellation, each alphabet corresponding to a pair of discrete signal values, said selection being made as a function of the r+1 bit group so that 2^r signalling alphabets correspond to all permitted transitions from each current internal state of said convolutional coding process to all possible next states of said convolutional coding process, and so that the 2^r signalling alphabets have a larger minimum distance from each other than the minimum distance within the complete set of 2^{r+1} signalling alphabets, and

(c) transmitting the pairs of discrete signal values corresponding to the selected signalling alphabets in sequence,

wherein said signal constellation is arranged so that the same signal constellation is obtained when the original constellation is rotated by 90, 180 or 270 degrees, and

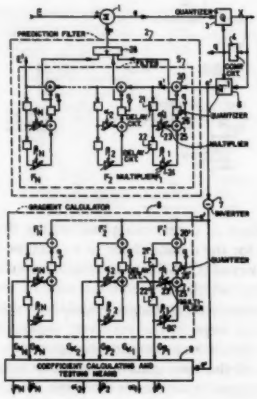
wherein rotation of said constellation by 90, 180 or 270 degrees produces the same effect on said transmitted discrete signal values as modification of only said current values of said p stored bits without modification of said values of said current r bit group.

4,520,491

TRANSMISSION SYSTEM USING DIFFERENTIAL PULSE CODE MODULATION WITH ADAPTIVE PREDICTION

Jean M. Raulin, Noisy le Sec, and Georges Bonnerot, Les Ulis, both of France, assignors to Telecommunications Radioelectriques et Telephoniques T. R. T., Paris, France

Filed Nov. 4, 1982, Ser. No. 439,146
Claims priority, application France, Nov. 4, 1981, 81 20676
Int. Cl.³ H03K *13/22*
U.S. Cl. 375—27 **17 Claims**

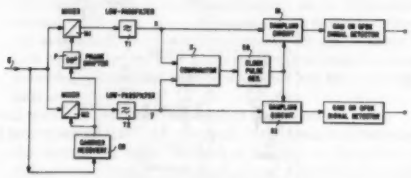


1. A digital information transmission system using differential pulse code modulation and comprising an encoder for converting an incoming linear PCM signal into a differential PCM signal with a reduced number of bits, and a remote decoder for carrying out the inverse conversion, the encoder comprising a difference circuit forming a difference signal between the incoming linear PCM signal and a prediction signal, a first quantizer operating with a quantizing step and quantizing the difference signal to form the differential PCM signal and a local decoder receiving the differential PCM signal and forming the prediction signal, the local decoder and the remote decoder being constituted in the same manner and comprising each a second quantizer operating inversely to said first quantizer of the encoder and a filter constituted by a cascade arrangement of filtering sections, each section being provided with a round-off (or truncation) circuit operating with a step equal to the quantizing step of the first quantizer, characterized in that the filters of the local decoder and the remote decoder comprise several filtering sections of the second order having two coefficients, at least one of which is controllable, the controllable coefficients of corresponding sections of the filter of the local decoder and the filter of the remote decoder being controlled by identical control circuits receiving the same signal derived from the differential PCM signal and comprising means for calculating the controllable coefficients by successive iterations so as to minimize a predetermined function of the difference signal produced in the encoder, as well as means for testing, for each section and at each iteration, whether each controllable coefficient affected by a calculated modification term is larger than an upper limit value or smaller than a lower limit value, said means for testing determining that these limit values are such that the poles of the transfer function in Z of said section lie just inside a circle of unit radius, the modified value retained for said controllable coefficient being the nearest limit value when the test is positive and being the value affected by the calculated modification term when the test is negative.

4,520,492
METHOD FOR DETERMINING THE OPTIMUM SAMPLING TIMES FOR A QPSK OR QAM RECEIVED SIGNAL

Herbert Weber, Backnang, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,163
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146281
Int. Cl.³ H04B *15/02*
U.S. Cl. 375—86 **2 Claims**

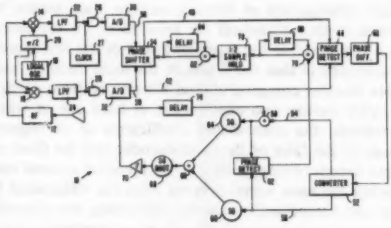


1. A method of determining and setting the optimum sampling times for the demodulator of a receiver for a quadrature phase shift keyed (QPSK) or quadrature amplitude modulated (QAM) signal which has been influenced by interference in the radio link between a transmitter and the receiver, comprising the following steps in the receiver; separating the received signal into its two quadrature components; comparing the amplitudes of the two quadrature components; producing a synchronizing pulse whenever the amplitudes of the two quadrature components being compared have the same magnitude; and feeding said synchronizing pulses to the demodulator for the received signal to cause the demodulator to sample the received signal at points in time corresponding to said pulses.

4,520,493
ADAPTIVE RECURSIVE FREQUENCY OFFSET TRACKING SYSTEM

Charles M. Heard, Venice, and Frank C. Yang, Anaheim, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Dec. 7, 1981, Ser. No. 327,667
Int. Cl.³ H04L *27/16*
U.S. Cl. 375—97 **14 Claims**

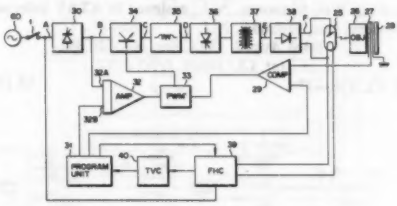


1. An adaptive recursive frequency offset tracking system for acquiring and tracking a received electromagnetic data signal comprising:
- means for generating a complex baseband signal from the received signal;
- means for sampling the complex baseband signal to derive a plurality of complex samples;
- means for comparing the phase of successive samples to extract signals representing the phase difference between the two samples;
- means for converting the phase difference signals to phasor signals;
- first filter means for deriving a track quality indication from the phasor signals;
- second filter means having a bandwidth controlled by the track quality indication for deriving from the phasor signals an estimate of the frequency offset of the received data signal; and
- means for correcting the phase of the received data signal samples in response to the estimate of frequency offset to substantially compensate for the frequency offset.

4,520,494
X-RAY DIAGNOSTIC APPARATUS

Masataka Arita, Tustin, Calif., and Mitsuyoshi Matsubara, Tochigi, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 8, 1983, Ser. No. 502,117
Claims priority, application Japan, Jun. 11, 1982, 57-99143
Int. Cl.³ G03B *41/16*; H05G *1/30, 1/10*
U.S. Cl. 378—108 **5 Claims**



1. An X-ray diagnostic apparatus comprising:
- a low voltage power source;
- AC-DC converting means connected to the low voltage power source so as to apply a rectified low DC voltage;
- chopping means connected to the AC-DC converting means and chopping said DC voltage into a low AC voltage;
- high voltage applying means for transforming said low AC voltage into a high AC voltage, said high AC voltage being applied as a tube voltage to an X-ray tube from which X-rays are irradiated toward an object to be examined;
- means for controlling a filament heating power of the X-ray tube;
- programming means for supplying a control signal to said filament heating control means so as to reduce the emission current of said X-ray tube during the irradiation; and
- chopper control means for controlling the chopping ratio of said chopping means by evaluating said rectified DC voltage with a preset tube voltage generated in said programming means; said programming means compensating said tube voltage by receiving said control signal in such a manner that said tube voltage is maintained substantially constant during the irradiation by varying said preset tube voltage so as to control the chopping ratio based upon the reduction of the filament heating power for the X-ray tube.

4,520,495
FAILURE DETECTION CIRCUIT FOR AN X-RAY TUBE

Shigeru Tanaka, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 26, 1982, Ser. No. 444,368
Claims priority, application Japan, Nov. 30, 1981, 56-192016
Int. Cl.³ H05G *1/26, 1/34, 1/54*
U.S. Cl. 378—117 **10 Claims**

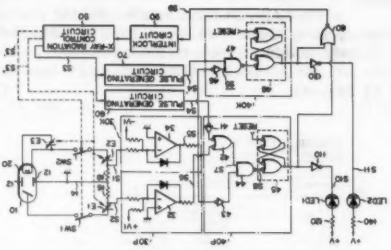
1. A failure detection arrangement for an X-ray tube of the type having an anode, a cathode and a grounded center metal, comprising:
- a first high voltage source for applying a positive high voltage between said anode and ground;

a first switch in the circuit of said first high voltage source and said anode;

a second high voltage source for applying a negative high voltage between said cathode and ground;

a second switch in the circuit of said second high voltage source and said cathode;

control circuit means for generating X-ray control signals for controlling said first and second switches for selectively closing and opening circuit paths of said anode and cathode;



failure detection means for detecting when a cathode current is flowing and substantially simultaneously therewith an absence of any anode current and generating in response to such detection a failure detection signal; and

means, responsive to said failure detection signal, for causing said control circuit means to interrupt power flow to said tube by controlling of said first and/or second switches.

4,520,496

ROTARY-ANODE X-RAY TUBE

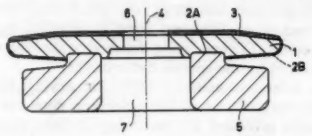
Peter Schreiber, Rellingen, and Klaus Huth, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,377

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1982, 3226858

Int. Cl.³ H01J *35/10*

U.S. Cl. 378—128 **6 Claims**



1. A rotary-anode X-ray tube comprising an anode disc having a body which comprises first and second rotationally-symmetrical, interconnected parts which are adjacently situated in the direction of an axis of rotation, the first part bearing a focal path on a surface extending transversely of said axis and consisting essentially of molybdenum or a molybdenum alloy and the second part consisting essentially of graphite, the volume of the second part amounting to at least one half of the volume of the first part, characterized in that an outer diameter of a connection zone between the first and second parts is smaller than an inner diameter of the focal path.

4,520,497

ARRANGEMENT FOR PROJECTING DATA ONTO FILM

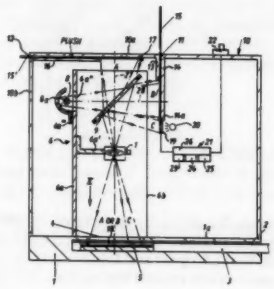
Reimund Kluge, Unterhaching, and Eberhard Werner, Peiting, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,762

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1980, 3043068

Int. Cl.³ H05G *1/28*

U.S. Cl. 378—166 **16 Claims**



1. An arrangement for projecting data onto radiation-sensitive material comprising:

(a) receiving means for holding an interchangeable data carrier at either of a pair of locations having respective regions for the illumination of a data-carrying part of the interchangeable data carrier;

(b) supporting means for radiation-sensitive material, said supporting means including holding means for a cassette which accommodates a sheet of radiation-sensitive material and is provided with an aperture which is capable of being sealed against light and of being opened to expose a portion of the radiation-sensitive material to the image of the data-carrying part of the interchangeable data carrier; and

(c) projecting means for projecting an image of the data-carrying part of the interchangeable data carrier onto the radiation-sensitive material, said projecting means including a source of illumination which is positioned substantially on the optical axis of a first of said regions and is arranged to illuminate both said first region and the second of said regions, and said projecting means further including a member which transmits a portion of the light from said source to one of said regions and reflects light from said one region towards said supporting means, said member reflecting a portion of the light from said source to the other of said regions and transmitting light from said other region towards said supporting means, and said member being located between said source and said first region.

4,520,498

AM STEREO MODULATOR

David L. Hershberger, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Jun. 24, 1983, Ser. No. 507,563

Int. Cl.³ H04H *5/00*

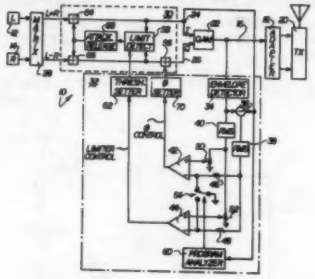
U.S. Cl. 381—16 **10 Claims**

1. An AM stereo modulator, comprising:

limiter means responsive to first and second audio frequency signals for providing first and second amplitude limited signals in response thereto, said first and second amplitude limited signals being substantially equally limited,

quadrature amplitude modulator means responsive to said first and second amplitude limited signals for providing an

amplitude modulated carrier signal having in-phase and quadrature-phase components modulated in accordance with said first and second amplitude limited signals, respectively, and



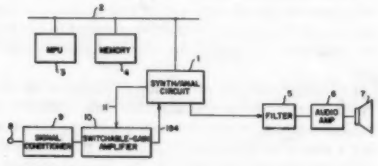
detector means for detecting the extent to which the envelope of said modulated carrier signal differs from said first amplitude limited signal and for controlling the amplitude limitations imposed on said first and second signals by said limiter means in accordance therewith.

4,520,499

COMBINATION SPEECH SYNTHESIS AND RECOGNITION APPARATUS

Terry Montlick, Somers; Klaus Skoge, Cromwell, both of Conn.; David C. Vetter, Greenfield, and Paul R. Ahrens, Longmeadow, both of Mass., assignors to Milton Bradley Company, Springfield, Mass.

Filed Jun. 25, 1982, Ser. No. 392,309
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—36 **14 Claims**



1. An apparatus for synthesizing speech from stored representations and for generating representations of speech for use in speech analysis, including but not limited to speech recognition, such apparatus being reconfigurable between the two functions and comprising:

A. a lattice filter including elements which are configurable selectively to provide an all-pole transfer function for synthesis and an all-zero transfer function for analysis, the lattice filter being responsive to coefficients supplied thereto;

B. an input converter for converting analog representations of acoustic waveforms to signals suitable for processing by said all-zero lattice filter;

C. an output converter coupled to said all-pole reconfigured lattice filter for coverting the output signals from said filter to analog signals suitable for conversion into acoustic waveforms;

D. an excitation source for supplying to the input of said all-pole filter signals representing vocal tract excitation;

E. a filter coefficient correction means for modifying lattice filter coefficients responsive to a speech signal being analyzed, to generate representations of such speech;

F. means for receiving filter coefficients for speech synthesis;

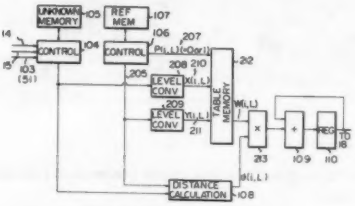
G. means for selectively interconnecting, for speech synthesis or analysis, the lattice filter, the input converter, the output converter, the excitation source, the filter coefficient correction means and the coefficient receiving means.

4,520,500

SPEECH RECOGNITION SYSTEM

Kaneyoshi Mizuno; Isamu Nose, and Hirosi Iizuka, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 29, 1982, Ser. No. 373,147
Claims priority, application Japan, May 7, 1981, 56-67614; Jul. 15, 1981, 56-109265; Nov. 19, 1981, 56-184416
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **7 Claims**



1. A speech recognition system comprising:

(a) an input terminal (**11**) for accepting an input speech signal to be recognized,

(b) a frequency analyzer (**12**) coupled with said input terminal (**11**), for providing the spectrum of the input speech signal,

(c) a spectrum converter (**16**) coupled with the output of the frequency analyzer (**12**), for converting the spectrum from said frequency analyzer (**12**) to the difference between said spectrum and the least square fit line of said spectrum and delivering a spectrum-converted output $\bar{x}^I(i,L)$,

(d) a speech detector (**13**) coupled with the output of said frequency analyzer (**12**) for detecting the start point and the end point of the input speech,

(e) a distance calculation means (**17**) for calculating the distance between the converted spectrum of input speech and the converted spectrum of each of a number of reference data, and

(f) a decision circuit (**18**) for recognizing an input speech by selecting the minimum distance among the outputs of said distance calculation means (**17**), CHARACTERIZED IN THAT

said distance calculation means (**17**) comprises:

(g) an input memory (**105**) for storing the output $\bar{x}^I(i,L)$ of said spectrum converter (**16**), the storing operation being started when the start point is detected by the speech detector (**13**) and being finished when the end point is detected by the speech detector (**13**),

(h) a reference memory (**107**) for storing the converted spectrum $\bar{x}^R(i,L)$ of the reference data and an original weight provided for particular portions of the reference data,

(i) a distance calculator (**108**) for calculating the distance $|\bar{x}^R(i,L)-\bar{x}^I(i,L)|$ between the output $\bar{x}^I(i,L)$ of said input memory (**105**) and the converted spectrum $\bar{x}^R(i,L)$ of the output of said reference memory (**107**),

(j) weight adjusting means (**208, 209, 212**; or **310, 320, 330, 340, 350**) for adjusting the original weight read out from the reference memory (**107**) according to the output $\bar{x}^I(i,L)$ from the input memory (**105**) and the converted spectrum $\bar{x}^R(i,L)$ of the reference data from the reference memory (**107**), and providing the weight w(i,L),

(k) a multiplier (**213**) for providing $w(i,L)x|\bar{x}^R(i,L)-\bar{x}^I(i,L)|$ by multiplying the output $|\bar{x}^R(i,L)-\bar{x}^I(i,L)|$ of said distance calculator (**108**) and the weight w(i,L) provided

by said weight adjusting means (**208, 209, 212**; or **310, 320, 330, 340, 350**), and

(l) means for accumulating the output of said multiplier (**213**) to provide the resultant distance to said decision circuit (**18**).

4,520,501

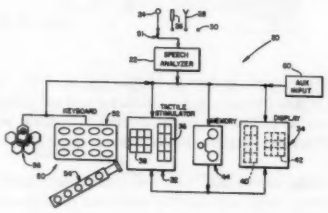
SPEECH PRESENTATION SYSTEM AND METHOD

Denyse C. DuBrucq, Arlington, Va., assignor to Ear Three Systems Manufacturing Company, Arlington, Va.

Continuation of Ser. No. 435,345, Oct. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 365,772, Apr. 5, 1982, abandoned. This application Apr. 30, 1984, Ser. No. 605,978

Int. Cl.[3] **G01L** *1/00*

U.S. Cl. 381—48 **54 Claims**



1. A method of presenting speech information comprising separating speech into a sequence of phonemes representative of the speech; transforming each phoneme into first and second grid patterns of points, the first pattern being a code which identifies the phoneme sound and the second pattern being another code which identifies a mouth form that produces the phoneme sound; and presenting the first and second patterns by activating presenters arranged in a multiple point grid matrix in accordance with said patterns of points.

4,520,502

SPEECH SYNTHESIZER

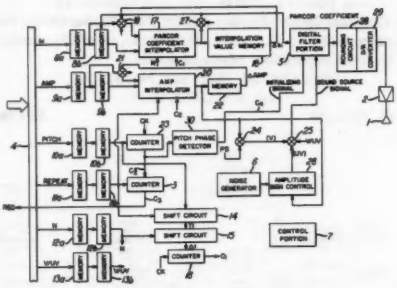
Sumio Fujita, Tokyo, Japan, assignor to Seiko Instruments & Electronics, Ltd., Tokyo, Japan

Filed Apr. 27, 1982, Ser. No. 372,282

Claims priority, application Japan, Apr. 28, 1981, 56-64633

Int. Cl.[3] **G10L** *1/00*

U.S. Cl. 381—51 **2 Claims**



1. A speech synthesizer using variable frame lengths obtained by multiplication of a pitch period analyzed from original speech data by the number of repetitions of substantially the same waveform as that in the pitch period comprising: first circuit means for determining a frame interval from pitch data and repeat time data in the speech data and producing a corresponding frame interval signal; second circuit means responsive to the frame interval signal for generating a PARCOR coefficient interpolation timing signal for each PARCOR coefficient interpolation; pitch period generating means connected to receive the pitch data for generating an amplitude interpolation timing signal; third circuit means for interpolating a PARCOR coefficient in response to the PARCOR coefficient interpolation timing signal and for interpolating an amplitude value in response to the amplitude interpolation timing signal; digital filter means connected to receive the interpolated PARCOR coefficient data and the interpolated amplitude data for filtering the data, the digital filter means including resettable delay circuit means connected to the pitch period generating means for producing an initializing signal each pitch period to reset the delay circuit means; and acoustic means for producing a speech sound in response to the data output from the digital filter means.

4,520,503

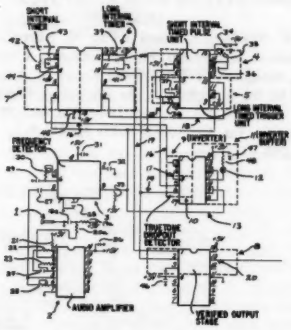
TONE DISCRIMINATION CIRCUIT

John A. Kirst, and Daniel F. Kutz, both of Albuquerque, N. Mex., assignors to University of New Mexico, Albuquerque, N. Mex.

Filed Oct. 14, 1983, Ser. No. 541,860

Int. Cl.[3] **G08B** *17/00*; **H04R** *29/00*

U.S. Cl. 381—56 **6 Claims**



1. Circuit, comprising:

(a) a microphone means, having an audio input and an electrical output, for converting an audible tone of a given frequency received at said audio input, into an audio frequency electrical signal (hereinafter "audio signal") of the same frequency at said electrical output;

(b) an amplifier means, having an input and an output, said input being connected to said electrical output of said microphone means, for detecting only audio signals exceeding a desired amplitude level;

(c) a frequency detector means, having an input and an output, said input of said frequency detector means being connected to said output of said amplifier means, for passing through said frequency detector means only audio signals falling in a desired frequency passband;

(d) time discrimination circuit, comprising:

(1) a short interval timed pulse unit, having an input and an output, said input of said short interval timed pulse unit being connected to said output of said frequency detector means;

(2) a short interval timer, having an input and an output, said input of said short interval timer being connected in parallel with said short interval timed pulse unit to said output of said frequency detector means;

(3) a long interval timed trigger unit, having an input and an output, said input of said long interval timed trigger unit being connected in parallel with said short interval timed pulse unit and said short interval timer to said output of said frequency detector means;

(4) a long interval timer, having an input and an output, said input of said long interval timer being connected in series to said output of said long interval timed trigger unit;

(5) an inverter, having an input and an output, said input of said inverter being connected in series to said output of said short interval timer;

(6) a truetone dropout indicator, which is a NAND gate, having a first input, a second input and an output, said first input of said truetone dropout indicator being connected in series to said output of said inverter, said second input of said truetone dropout indicator being connected in series to said output of said short interval timed pulse unit;

(7) a verified output stage, having a first input, a second input, and an alarm line as an output, said first input of said verified output stage being connected in series to said output of said truetone dropout indicator, said second input of said verified output stage being connected in series to said output of said long interval timer.

4,520,504

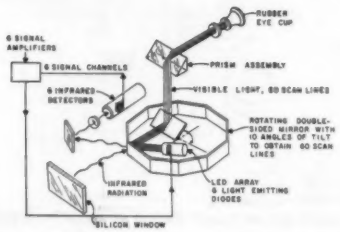
INFRARED SYSTEM WITH COMPUTERIZED IMAGE DISPLAY

Ronald P. Walker, Kirtland AFB, N. Mex.; John D. Rex, Chelmsford, and John H. Schummers, Concord, both of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 29, 1982, Ser. No. 403,246

Int. Cl.³ G06K *9/00*; H04N *7/18*

U.S. Cl. 382—1 **16 Claims**


RUBBER EYE CUP
6 SIGNAL AMPLIFIERS
6 SIGNAL CHANNELS
PRISM ASSEMBLY
6 INFRARED DETECTORS
VISIBLE LIGHT, 60 SCAN LINES
ROTATING DOUBLE-SIDED MIRROR WITH 10 ANGLES OF TILT TO OBTAIN 60 SCAN LINES
INFRARED RADIATION
LED ARRAY 6 LIGHT EMITTING DIODES
SILICON WINDOW

1. An infrared imaging system comprising:

an infrared scanner which receives infrared radiation from a scene and produces analog signals for a plurality of individual pixels in frames with a scanning raster, including sync signals;

a digitizer which receives said analog signals and sync signals and produces corresponding digital signals, providing a digital value for each pixel which is a function of the infrared intensity from said object;

processing means including memory means and a display generator for storing and processing a frame of the digital signals to create a display frame; and

means for displaying said display frame as an image of said scene;

wherein said processing means includes means to cause all pixel brightness values to be surveyed and the maximum and minimum values to be identified, means to cause said maximum and minimum values to be displayed at an operator's console and to permit entry of different values, and means to create a grey scale as part of the display frame;

whereby the system is capable of generating calibrated quantitative imagery which may be utilized as a diagnostic tool for the analysis of heat flow from surfaces.

4,520,505

CHARACTER READING DEVICE

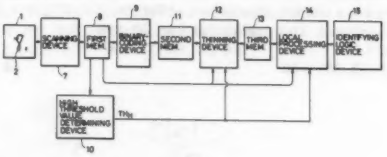
Katsuyoshi Yamamoto; Haruo Mizukami, and Hajime Nambu, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1982, Ser. No. 447,828

Claims priority, application Japan, Dec. 23, 1981, 56-208599; Jan. 14, 1982, 57-4612

Int. Cl.³ G06K *9/44*

U.S. Cl. 382—55 **7 Claims**



1. A character reading device comprising:

scanning means for scanning a character and subjecting said character to photo-electric conversion to form a multi-level character pattern having more than two density levels;

binary-coding means for binary-encoding said multi-level character pattern into picture elements of high and low levels according to a first threshold value, said binary-coding means thereby selecting picture elements of high levels;

means for determining a second threshold value higher than said first threshold value;

means for thinning those of the high level picture elements selected by said binary-coding means, the unencoded density levels of which are lower than said second threshold value, to form a thinned character pattern; and

means for comparing the level of those picture elements of said thinned character pattern, the density levels of which are lower than said second threshold value, with the levels of the picture elements surrounding said picture element for contrast, to determine whether the level of said picture elements is to be maintained at said high level or changed to said low level.

4,520,506

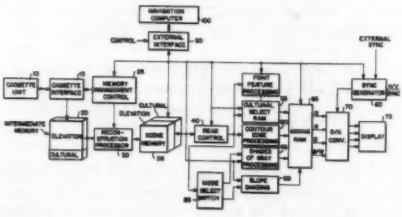
METHOD AND SYSTEM FOR COMPRESSION AND RECONSTRUCTION OF CULTURAL DATA FOR USE IN A DIGITAL MOVING MAP DISPLAY

Luen C. Chan, Indian Harbor Beach; Paul B. Beckwith, Indialantic, and Jeffrey B. Pearce, Melbourne, all of Fla., assignors to Harris Corporation, Melbourne, Fla.

Filed Oct. 20, 1981, Ser. No. 313,327

Int. Cl.³ G06K *9/36*

U.S. Cl. 382—56 **43 Claims**



1. A method of compressing data which is to produce an area feature in a display which is to be scanned in a predetermined direction, comprising the steps of:

eliminating all points of the area feature except for those points which form the boundary thereof;

eliminating the points which form that part of the boundary of the area feature which faces opposite said predetermined scanning direction; and

storing an address of an initial point at one end of the remaining part of the boundary of the area feature along with at least one delta code value which identifies a further point on the remaining part of the boundary with respect to the direction of the boundary at said initial point.

4,520,507

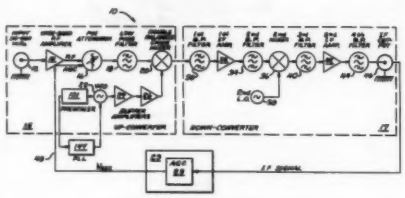
LOW NOISE CATV CONVERTER

Frederick H. Moon, Mt. Prospect, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Oct. 24, 1983, Ser. No. 544,947

Int. Cl.³ H04B *1/26;* H04H *1/02*

U.S. Cl. 455—3 **11 Claims**



9. A CATV frequency converter comprising:

a low noise wideband RF amplifier having a controllable operating point for amplifying a received CATV signal wherein the gain and terminal impedance of said amplifier are maintained substantially constant over a wide frequency band;

variable attenuation means coupled to said RF amplifier for the controlled attenuation of the amplified CATV signal;

an oscillator for generating a reference signal having a selected frequency;

a mixer coupled to said variable attenuation means and said oscillator for mixing said amplified CATV and reference signal to produce an IF signal;

an automatic gain control (AGC) system coupled to said mixer for developing an AGC control signal as a function of the level of the received CATV signal; and

means coupling the AGC control signal to said RF amplifier for controlling the operating point thereof and to said variable attenuation means, the attenuation of said variable attenuation means being controlled in response to said AGC control signal and the output of said RF amplifier.

4,520,508

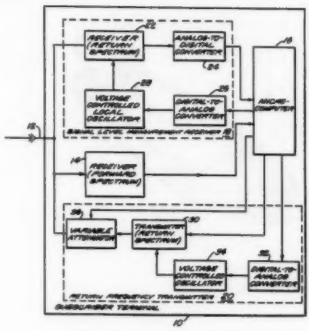
SUBSCRIBER TERMINAL FOR MONITORING RADIO-FREQUENCY SIGNAL INGRESS INTO CABLE TELEVISION SYSTEMS

Harry J. Reichert, Jr., Warminster, Pa., assignor to General Instrument Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 451,858, Dec. 21, 1982, abandoned. This application Jun. 26, 1984, Ser. No. 624,804

Int. Cl.³ H04H *1/02;* H04N *7/18*

U.S. Cl. 455—4 **8 Claims**



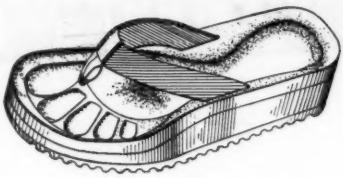
1. A subscriber terminal for connection to a headend by means of a cable, said terminal comprising means including first receiver means for monitoring and detecting the presence of at least one radio-frequency ingress signal on said cable, second receiver means connected to said cable for receiving coded signals from the headend, said coded signals including an ingress-frequency select signal and a return frequency command signal, means connected to the cable for transmitting a return signal to the headend at a specified return frequency, and control means operatively connected to said transmitting means and to said first and second receiver means and effective in response to said ingress-frequency select signal and return frequency command signal received from the headend, to select the frequency of said at least one ingress signal which said first receiver means is to monitor and detect, to code said return signal to represent information concerning the detected ingress signal and to control the transmitting means to transmit said return signal at said specified return frequency.

DESIGNS

MAY 28, 1985

278,945
BRASSIERE
Harold Stern, Wyckoff, N.J., and Elisabeth Suleiman, Newark, Del., assignors to International Playtex, Inc., Stamford, Conn.
Filed Feb. 4, 1983, Ser. No. 464,072
Term of patent 14 years
U.S. Cl. D2—24

278,946
THONG SANDAL
James Chen, Taipei, Taiwan, assignor to Volta Industrial Co., Ltd., Taipei, Taiwan
Filed Sep. 9, 1982, Ser. No. 416,398
Term of patent 14 years
U.S. Cl. D2—270

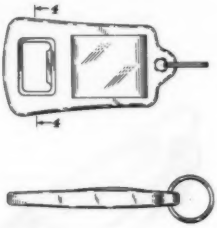


278,947
SHOE AND THE LIKE
Steven M. Foldes, 56 Walnut Ave., Conyngham, Pa. 18219
Filed Nov. 15, 1984, Ser. No. 671,870
Term of patent 14 years
U.S. Cl. D2—282

278,948
SHOE AND THE LIKE
Steven M. Foldes, Conyngham, Pa., assignor to Fun Footwear, Co., West Hazleton, Pa.
Filed Nov. 15, 1984, Ser. No. 671,868
Term of patent 14 years
U.S. Cl. D2—291

278,949
SLALOM SHOE SUITCASE
Jarmo A. Soininen, Helsinki, Finland, assignor to Asoma Oy, Helsinki, Finland
Filed Aug. 4, 1982, Ser. No. 405,208
Term of patent 14 years
U.S. Cl. D3—36

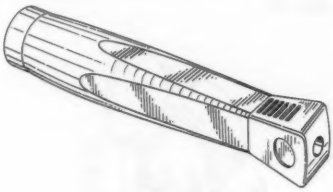
278,950
KEY TAG
Peter W. Vaughan, 33 Coronation St., Blackpool, England
Filed Dec. 16, 1982, Ser. No. 450,292
Claims priority, application United Kingdom, Jun. 24, 1982, 821007395
Term of patent 14 years
U.S. Cl. D3—62



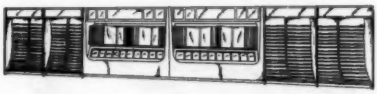
278,951
COSMETIC BRUSH
Stuart Kalinsky, 420 E. 80th St., New York, N.Y. 10021
Filed Apr. 4, 1984, Ser. No. 596,556
Term of patent 14 years
U.S. Cl. D4—135

278,952
COSMETIC BRUSH
Stuart Kalinsky, 420 E. 80th St., New York, N.Y. 10021
Filed Apr. 4, 1984, Ser. No. 596,557
Term of patent 14 years
U.S. Cl. D4—135

278,953
HANDLE FOR PAINT ROLLER FRAME
Morley L. Smith, Beaconsfield, Canada, assignor to T. S. Simms & Co. Limited, Saint John, Canada
Filed Jun. 1, 1981, Ser. No. 269,429
Claims priority, application Canada, Apr. 30, 1981, 30-04-81-4
Term of patent 14 years
U.S. Cl. D4—138



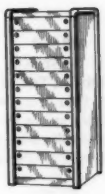
278,954
DISPLAY UNIT FOR SAMPLES OF FLOOR TILES, CARPETS OR SIMILAR ARTICLES
Anthony E. Bolyn, South Glens Falls, N.Y., assignor to Congoleum Corporation, Kearny, N.J.
Continuation of Ser. No. 217,362, Dec. 17, 1980, abandoned.
This application Apr. 25, 1983, Ser. No. 487,112
Term of patent 14 years
U.S. Cl. D6—409

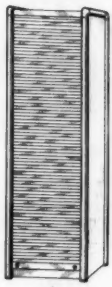


278,955
PARK BENCH
Duncan C. Syme, Chelsea; Vance R. Smith, Fish Hill, and Brian J. Tyrol, South Royalton, all of Vt., assignors to Vermont Castings, Inc., Randolph, Vt.
Filed Jun. 1, 1982, Ser. No. 383,776
Term of patent 14 years
U.S. Cl. D6—381

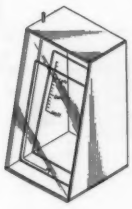
278,956
DESK WITH BUILT IN COMPUTER CONSOLE
Arnold Gordon, 685 Kirkglen Dr., San Jose, Calif. 95125
Filed Mar. 8, 1982, Ser. No. 356,057
Term of patent 14 years
U.S. Cl. D6—422

278,957
CABINET
Reinhard-Heinrich Flötotto, Bussardweg 3, D 4830 Gütersloh 11, Fed. Rep. of Germany
Filed Mar. 16, 1982, Ser. No. 358,712
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, MR1181
Term of patent 14 years
U.S. Cl. D6—432



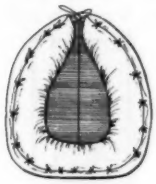


278,958
DISPLAY CASE FOR WATCHES OR THE LIKE
Mickey E. Novak, Corona Del Mar, Calif., assignor to Innovative Time Corporation, Carlsbad, Calif.
Filed Feb. 1, 1983, Ser. No. 482,956
Term of patent 14 years
U.S. Cl. D6—471

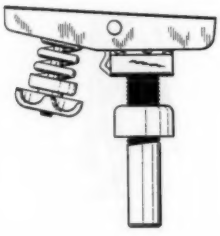


278,959
TABLE
Richard D. Berry, Jr., Hickory, N.C., assignor to Design Institute America, Inc., Montpelier, Ohio
Filed Mar. 3, 1983, Ser. No. 471,813
Term of patent 14 years
U.S. Cl. D6—480

278,960
FOOT PROTECTING CUSHION FOR A BED LEG
Joseph B. Shields, 3466 Balfour, Detroit, Mich. 48224
Filed Jul. 20, 1981, Ser. No. 284,680
The portion of the term of this patent subsequent to Jul. 5, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D6—491

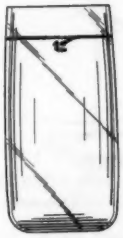


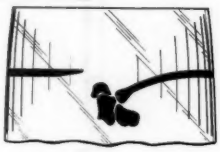
278,961
CHAIR CONTROL
Frank Doerner, 138 Aberdeen Rd., Kitchener, Ontario, Canada N2M 2Y7
Filed Apr. 21, 1983, Ser. No. 487,178
Claims priority, application Canada, Mar. 15, 1983, 15-03-83-8
Term of patent 14 years
U.S. Cl. D6—500

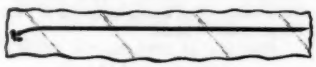


278,962
CHAMPAGNE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 403,221
The portion of the term of this patent subsequent to May 4, 1999, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—13

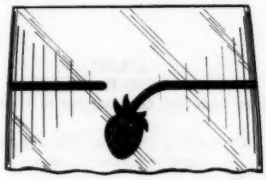
278,963
DRINKING GLASS OR THE LIKE
Thomas M. Dair; Davin B. Stowell, and Tucker L. Viemeister, all of New York, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 29, 1982, Ser. No. 427,750
Term of patent 14 years
U.S. Cl. D7—15



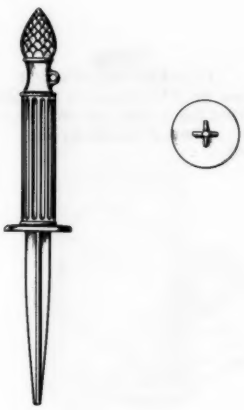




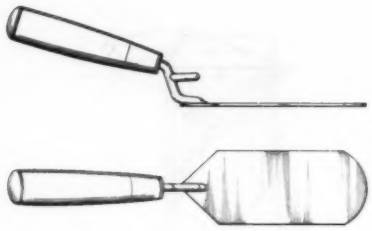
278,964
DRINKING GLASS OR THE LIKE
Thomas M. Dair; Davin B. Stowell, and Tucker L. Viemeister, all of New York, N.Y., assignors to Corning Glass Works, Corning, N.Y.
Filed Sep. 29, 1982, Ser. No. 428,881
Term of patent 14 years
U.S. Cl. D7—15



278,965
GARDEN MARKER-LAWN STANCHION
Walter D. Morton, 83 Homestead Dr., Millville, N.J. 08332
Filed Jan. 20, 1983, Ser. No. 459,384
Term of patent 14 years
U.S. Cl. D8—01

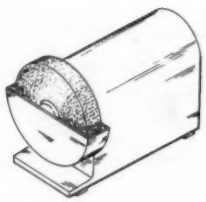


278,966
TROWEL
Randall C. Anaya, 3222 Ivar Ave., Rosemead, Calif. 91770
Filed Feb. 18, 1983, Ser. No. 467,493
Term of patent 14 years
U.S. Cl. D8—10



278,967
FOLDING HATCHET
Ronald Hewitt, Ludowici, Ga., assignor to Walter Webb, Metter, Ga.
Filed Jul. 6, 1982, Ser. No. 395,822
Term of patent 14 years
U.S. Cl. D8—76

278,968
CUTLERY SHARPENER
James E. Farmer, Sr., 1720 Commerce Rd., Athens, Ga. 30607
Filed Sep. 6, 1983, Ser. No. 529,331
Term of patent 14 years
U.S. Cl. D8—91



278,969
GLASS CUTTER
Conrad E. Johnson, 1163 Boylston St., Boston, Mass. 02115
Filed Dec. 23, 1982, Ser. No. 432,797
Term of patent 14 years
U.S. Cl. D8—98

278,970
HANDLE FOR GARDENING TOOL OR THE LIKE
Walter Kolb, Betzdorf, Fed. Rep. of Germany, assignor to Wolf-Gerate GmbH, Fed. Rep. of Germany
Filed May 14, 1982, Ser. No. 378,067
Term of patent 14 years
U.S. Cl. D8—107

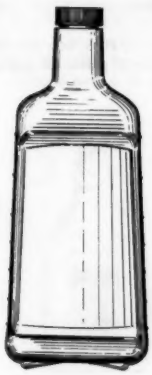
278,971
HAND GRIP HANDLE FOR DETACHABLE TOOLS
Lloyd T. Smith; Harold F. Bauer, both of Newton, and Allen K. Roth, Whitewater, all of Kans., assignors to Fiskar Manufacturing Corporation, Wausau, Wis.
Filed Sep. 30, 1982, Ser. No. 429,563
Term of patent 14 years
U.S. Cl. D8—107

278,972
COMBINED FASTENING BOLT AND LOCKING WASHER THEREFOR
Rune Fredriksson, Myrgatan 36 B, Avesta, Sweden (S-774 00)
Filed Jul. 28, 1981, Ser. No. 287,566
Claims priority, application Sweden, Jan. 28, 1981, 81-0179
Term of patent 14 years
U.S. Cl. D8—388

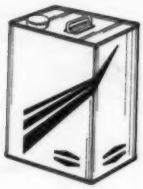
278,973
COMBINED BOTTLE AND CAP
Ned Harris, New City, N.Y., assignor to American Cyanamid Company, Stamford, Conn.
Filed Sep. 27, 1982, Ser. No. 423,886
Term of patent 14 years
U.S. Cl. D9—300

278,974
COMBINED BAG AND HANDLE
Sam W. Ray, Farmers Branch, Tex., assignor to Foam Tek, Inc., Dallas, Tex.
Filed Jan. 3, 1983, Ser. No. 455,052
Term of patent 14 years
U.S. Cl. D9—305

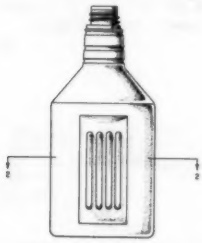
278,975
BOTTLE OR SIMILAR ARTICLE
William R. Gurolnick, Morton Grove, Ill., assignor to Gold Eagle Co., Chicago, Ill.
Filed Mar. 24, 1983, Ser. No. 478,380
Term of patent 14 years
U.S. Cl. D9—370



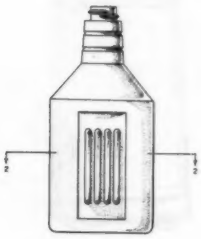
278,976
CAN
Iwao Morikawa, Mitaka, Japan, assignor to Kabushiki Kaisha KEM-O-PRO, Tokyo, Japan
Filed Sep. 29, 1982, Ser. No. 432,100
Claims priority, application Japan, Jun. 14, 1982, 57-26565
Term of patent 14 years
U.S. Cl. D9—376



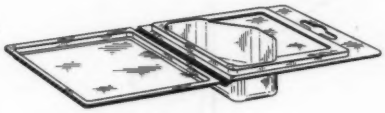
278,977
OIL CONTAINER
Thomas A. Franchi, Cobham, England, and Leslie B. Rogers, Red Bank, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Jan. 3, 1983, Ser. No. 455,442
Term of patent 14 years
U.S. Cl. D9—383



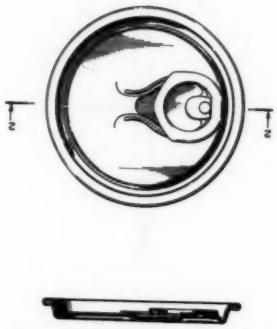
278,978
OIL CONTAINER
Thomas A. Franchi, Cobham, England, and Leslie B. Rogers, Red Bank, N.J., assignors to Mobil Oil Corporation, New York, N.Y.
Filed Jan. 3, 1983, Ser. No. 455,357
Term of patent 14 years
U.S. Cl. D9—383



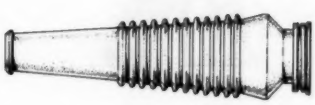
278,979
COMBINED PACKAGING AND DISPLAY CONTAINER
Kirk S. Anderson, Overland Park, Kans., and Scott D. Shane, Kansas City, Mo., assignors to Anderson Metals Corporation, Kansas City, Mo.
Filed Jan. 31, 1983, Ser. No. 462,607
Term of patent 14 years
U.S. Cl. D9—415



278,980
END CLOSURE FOR A CONTAINER
Omar L. Brown, Kettering; Don B. Peters, Dayton, and Jack L. Kalter, Kettering, all of Ohio, assignors to Ermal C. Fraze, Dayton, Ohio
Filed Sep. 17, 1982, Ser. No. 419,598
Term of patent 14 years
U.S. Cl. D9—438

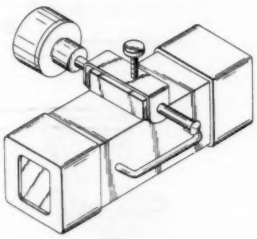


278,981
FLEXIBLE POURING SPOUT
P. J. Biermann, 14605 - 116 Ave., Edmonton, Alberta, Canada (T5M 3E8)
Filed May 17, 1983, Ser. No. 495,245
Term of patent 14 years
U.S. Cl. D9—447

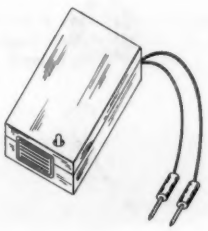


278,982
DISPLAY HOLDER FOR A CONTAINER OF LIPSTICK OR THE LIKE
John M. Van Zandt, 15932 Northfield, Pacific Palisades, Calif. 90272
Filed Jan. 20, 1983, Ser. No. 459,518
Term of patent 14 years
U.S. Cl. D9—457

278,983
MODULE FOR LASER WHEEL ALIGNMENT SYSTEM
James L. Woodruff, 1790 Skyline Blvd., Reno, Nev. 89509
Filed Feb. 17, 1982, Ser. No. 349,523
Term of patent 14 years
U.S. Cl. D10—46

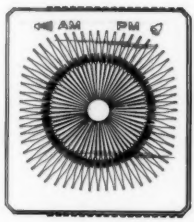


278,984
PORTABLE CIRCUIT TESTER
Joseph M. Roberts, Sr., P.O. Box 2383, Alameda, Calif. 94501
Filed Jul. 16, 1982, Ser. No. 398,819
Term of patent 14 years
U.S. Cl. D10—78

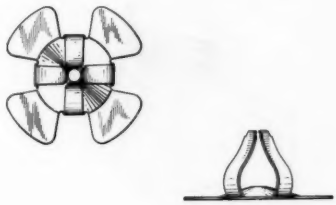


278,985
EXTENDIBLE AUTOMOTIVE ASHTRAY REFLECTOR
Judith A. Whitaker, 5563 Wedge La., Wescosville, Pa. 18106
Filed Jul. 1, 1982, Ser. No. 394,268
Term of patent 14 years
U.S. Cl. D10—111

278,986
ELECTRO-OPTIC DISPLAY FOR A TIMEPIECE
John T. Houlihan, Watertown, Conn., and Leonard M. Dorfman, Campbell, Calif., assignors to Timex Corporation, Waterbury, Conn.
Filed Mar. 30, 1983, Ser. No. 480,630
Term of patent 14 years
U.S. Cl. D10—125



278,987
EARRING NUT
Wilhelm Zauderer, New York, N.Y., assignor to William Findings Corporation, New York, N.Y.
Filed Apr. 22, 1983, Ser. No. 487,889
Term of patent 14 years
U.S. Cl. D11—88



278,988

CHRISTMAS TREE ORNAMENT

Willa J. Steiner, 10311 Benson, Overland Park, Kans. 66212

Filed Aug. 15, 1983, Ser. No. 522,994

Term of patent 14 years

U.S. Cl. D11—125

278,989

RECEPTACLE FOR HYDROPONICS

Gerhard Baumann, Quellenrain 32, Ittigen, Switzerland (CH-3063)

Filed Dec. 9, 1983, Ser. No. 559,648

Claims priority, application Hague, Jun. 14, 1983, DM/002 591

Term of patent 14 years

U.S. Cl. D11—152

278,990

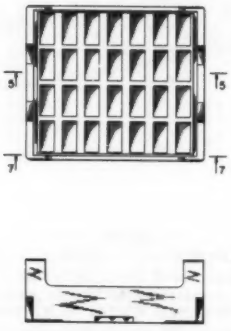
BOX FOR CULTIVATING VEGETABLES OR THE LIKE

Toshiro Kaneko, 20-3, Nakashinden, Yaizu-shi, Shizuoka-ken, Japan

Filed Nov. 29, 1983, Ser. No. 556,079

Term of patent 14 years

U.S. Cl. D11—155



278,991

FIGURINE OF A GOOSE

Jesus A. C. Santa-Eulalia, and Javier B. C. Santa-Eulalia, both of Montevideo, Uruguay, assignors to John J. Madison Company, Inc., Laguna Hills, Calif.

Filed Jun. 17, 1982, Ser. No. 389,548

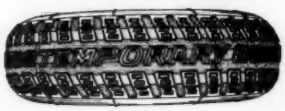
Term of patent 14 years

U.S. Cl. D11—162

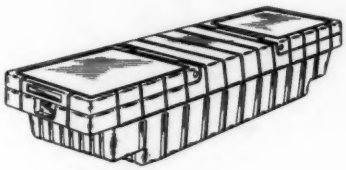
278,992
AUTOMOBILE
Werner Breitschwerdt, Stuttgart; Friedrich van Winsen, Kirchheim, and Bruno Sacco, Sindelfingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany
Filed Apr. 13, 1982, Ser. No. 367,998
Claims priority, application Fed. Rep. of Germany, Oct. 15, 1981, 5376
Term of patent 14 years
U.S. Cl. D12—92

278,993
BABY CARRIAGE
Kenzou Kassai, Osaka, Japan
Division of Ser. No. 171,996, Jul. 24, 1980, Pat. No. D. 269,421.
This application Sep. 22, 1982, Ser. No. 421,029
Claims priority, application Japan, Jan. 29, 1980, 55-2658; Feb. 13, 1980, 55-5197; Feb. 13, 1980, 55-5199
Term of patent 14 years
U.S. Cl. D12—129

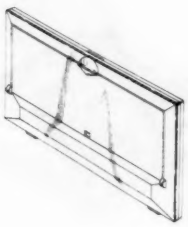
278,994
VEHICLE TIRE
Hideaki Nishio, Saitama, and Yuji Tateo, Tokyo, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan
Filed Sep. 8, 1983, Ser. No. 530,438
Claims priority, application Japan, Mar. 11, 1983, 58-9746
Term of patent 14 years
U.S. Cl. D12—137



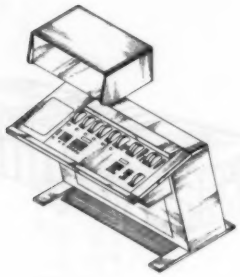
278,995
TRUCK TOOL BOX
John E. Waters, Waco, Tex., assignor to Advanced Plastics, Inc., Jonesboro, Ark.
Filed Jul. 25, 1983, Ser. No. 516,776
Term of patent 14 years
U.S. Cl. D12—157



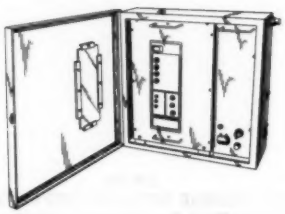
278,996
VANITY MIRROR WITH HINGED COVER FOR ATTACHMENT TO THE SUN VISOR OF AN AUTOMOBILE
Kwok K. Cheung, Kwai Chung, Hong Kong, assignor to Wai Hing Industrial Manufacturing Factory, Kwai Chung, Hong Kong
Filed Nov. 29, 1982, Ser. No. 445,172
Claims priority, application United Kingdom, May 28, 1982, 1006974
Term of patent 14 years
U.S. Cl. D12—191



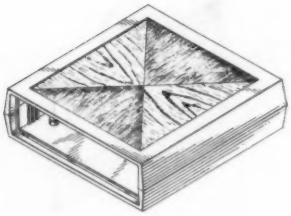
278,997
LIGHTING SYSTEM CONTROL CONSOLE
Denis G. Wolfe, Agoura; Thomas S. Young, Los Angeles, both of Calif.; Arnold S. Wasserman, Pittsford, N.Y., and Edward Lawing, Columbus, Ohio, assignors to Colortran, Inc., Burbank, Calif.
Filed Oct. 1, 1982, Ser. No. 432,268
Term of patent 14 years
U.S. Cl. D13—12



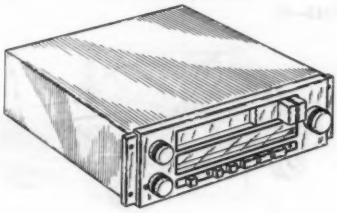
278,998
PUMP MONITOR
Paul D. Eckstedt, Campbell, and Robert W. Caton, Morgan Hill, both of Calif., assignors to FMC Corporation, Chicago, Ill.
Filed Mar. 14, 1983, Ser. No. 474,953
Term of patent 14 years
U.S. Cl. D13—35



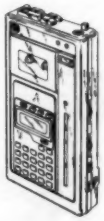
278,999
CIRCUITRY COMPONENT CASING
Joseph Zimmerman, 21401 SW. 127 Ave., Miami, Fla. 33177
Filed Mar. 14, 1983, Ser. No. 475,092
Term of patent 14 years
U.S. Cl. D13—40



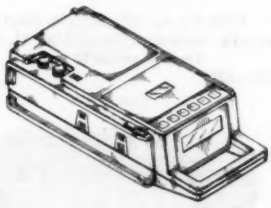
279,000
COMBINED AUTOMOBILE TAPE PLAYER AND RADIO RECEIVER
Karl A. Sarges, Wetzlar, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Dec. 20, 1982, Ser. No. 451,520
Claims priority, application Benelux, Jun. 29, 1982, 56968-01
Term of patent 14 years
U.S. Cl. D14—5



279,001
PORTABLE COMBINED MICRO-CASSETTE TAPE RECORDER, RADIO AND CALCULATOR
Minoru Nagasawa, Tokyo, Japan, assignor to Nippon Chemi-Con Corporation, Tokyo, Japan
Filed Feb. 28, 1983, Ser. No. 470,741
Claims priority, application Japan, Sep. 3, 1982, 57-40205
Term of patent 14 years
U.S. Cl. D14—5



279,002
ECG AND VOICE CASSETTE RECORDER
Lawrence L. Labuda, Issaquah; Gregory A. Linstad, Woodinville; Paul W. Jones, Issaquah, and John C. Daynes, Monroe, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.
Filed Jul. 19, 1982, Ser. No. 399,776
Term of patent 14 years
U.S. Cl. D14—6

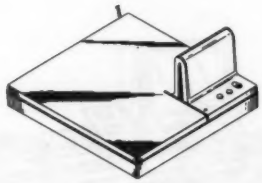


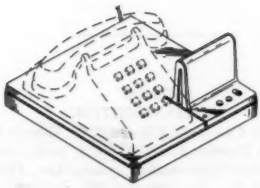
279,003

CODE ATTACHMENT HOUSING FOR A TELEPHONE STAND

Morison Cousins, New York, N.Y., assignor to International Mobile Machines Corp., Bala Cynwyd, Pa.

Filed Jul. 9, 1982, Ser. No. 396,874
Term of patent 14 years
U.S. Cl. D14—60



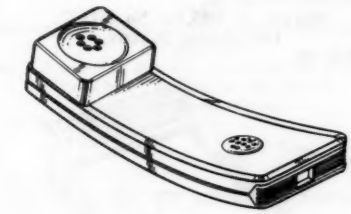


279,004

HOUSING FOR A TELECOMMUNICATIONS HANDSET

Desmond J. Ryan, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Nov. 18, 1982, Ser. No. 442,596
Claims priority, application Canada, Oct. 20, 1982, 20-10-82-1
Term of patent 14 years
U.S. Cl. D14—63

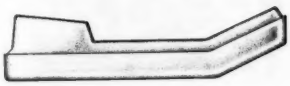


279,005

HOUSING FOR A TELEPHONE HANDSET OR SIMILAR ARTICLE

Donald M. Genaro, Haworth; Richard M. Joffe, Palisades Park, both of N.J., and John N. McGarvey, Drexel Hill, Pa., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Aug. 29, 1984, Ser. No. 645,184
Term of patent 14 years
U.S. Cl. D14—63



279,006

PORTABLE TELEVISION RECEIVER

Naoto Fukasawa; Susumu Suzuki, and Noritaka Uchihori, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,693
Claims priority, application Japan, May 11, 1982, 57-20154
Term of patent 14 years
U.S. Cl. D14—77

279,007

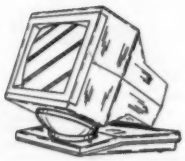
ADJUSTABLE COMPUTER DISPLAY AND BASE

Edward H. Empson, San Jose; Robert D. Brunner, Oakland, and Gerard A. Fubershaw, Mountain View, all of Calif., assignors to Fortune Systems Corporation, Redwood City, Calif.

Filed Jun. 1, 1982, Ser. No. 383,747

Term of patent 14 years

U.S. Cl. D14—113



279,008

HOUSING FOR A WAVEGUIDE FEED FOR A PARABOLIC DISH ANTENNA

Robert G. Arcieri, 5919 E. Caron Cir., Scottsdale, Ariz. 85253

Filed Sep. 12, 1983, Ser. No. 531,205

Term of patent 14 years

U.S. Cl. D14—90

279,009

PERSONAL COMPUTER

Kunio Akiyama, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan

Filed Oct. 15, 1982, Ser. No. 434,591

Claims priority, application Japan, May 21, 1982, 57-22498

Term of patent 14 years

U.S. Cl. D14—106

279,010

VIDEO MONITOR

Vittorio Ceradelli, Cascinette D'Ivrea, Italy; Donald M. Genaro, Haworth, and Thomas J. Kelly, Colts Neck, both of N.J., assignors to AT&T Information Systems Inc., Holmdel, N.J.

Filed Jun. 22, 1984, Ser. No. 623,828

Term of patent 14 years

U.S. Cl. D14—113

279,011

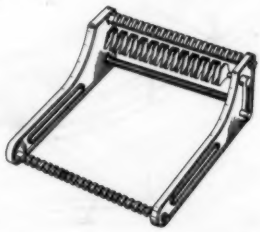
LOOM

Merry S. Riehm, East Aurora, N.Y., assignor to The Quaker Oats Company, Chicago, Ill.

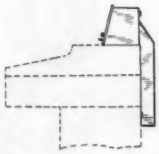
Filed Jan. 27, 1983, Ser. No. 461,657

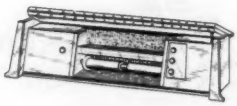
Term of patent 14 years

U.S. Cl. D15—66

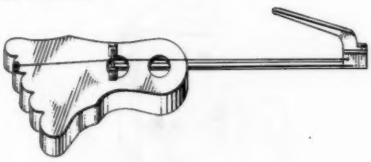


279,012
ORGAN PLAYER ATTACHMENT
Lee Von Gunten, 1515 Crabtree, Arlington Heights, Ill. 60004
Filed Oct. 2, 1978, Ser. No. 947,935
Term of patent 14 years
U.S. Cl. D17—9

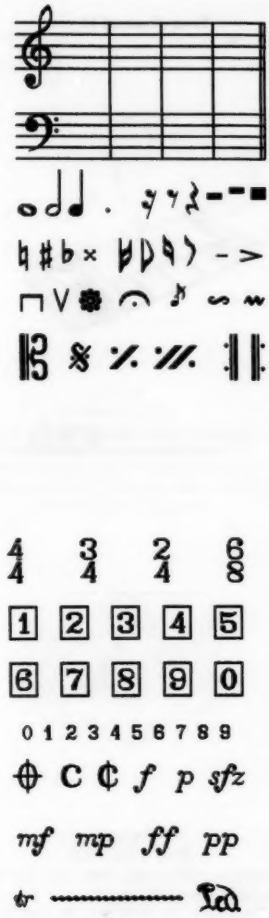




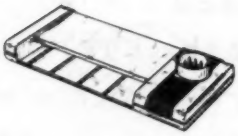
279,013
ORNAMENTAL DESIGN FOR A GUITAR OR SIMILAR INSTRUMENT
Harry A. Sowle, P.O. Box 633, Carrabelle, Fla. 32322
Filed Mar. 18, 1983, Ser. No. 476,545
Term of patent 14 years
U.S. Cl. D17—18



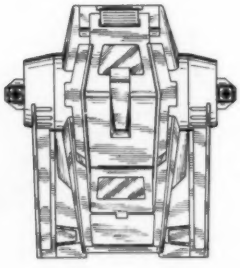
279,014
FONT FOR MUSICAL SYMBOLS
Richard A. Brodie, 2605 Guinevere Dr., Oceanside, Calif. 92054
Filed Aug. 22, 1983, Ser. No. 525,025
Term of patent 14 years
U.S. Cl. D18—32



279,015
COMBINED HOLDER FOR WRITING INSTRUMENTS AND NOTE PAPER
Walter Henkels, Holunderweg 1, D-5142 Hückelhoven, Fed. Rep. of Germany
Filed May 4, 1983, Ser. No. 491,456
Claims priority, application Hague, Jan. 10, 1983, DM/002 125
Term of patent 14 years
U.S. Cl. D19—78

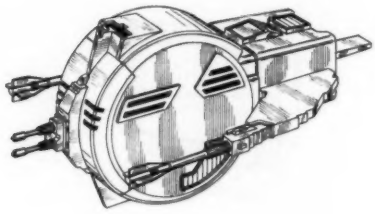


279,016
TOY VEHICLE
Mark D. Boudreaux, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Mar. 25, 1983, Ser. No. 478,967
Term of patent 14 years
U.S. Cl. D21—87



279,017
TOY VEHICLE
Mark D. Boudreaux, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Mar. 25, 1983, Ser. No. 478,968
Term of patent 14 years
U.S. Cl. D21—87

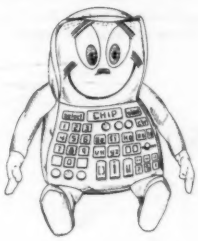
279,018
TOY VEHICLE
Mark D. Boudreaux, Cincinnati, Ohio, assignor to CPG Products Corp., Minneapolis, Minn.
Filed Dec. 19, 1983, Ser. No. 562,791
Term of patent 14 years
U.S. Cl. D21—87



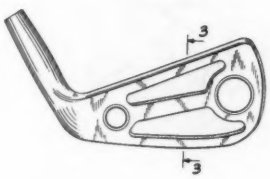
279,019
PLAYHOUSE
Loris Kyle, 697 Arlington Ave., Berkeley, Calif. 94707
Filed Nov. 22, 1982, Ser. No. 443,348
Term of patent 14 years
U.S. Cl. D21—114

279,020
CLOWN DOLL
Don M. Jennings, P.O. Box 14059, Arlington, Tex. 76013
Filed Dec. 27, 1982, Ser. No. 453,459
Term of patent 14 years
U.S. Cl. D21—173

279,021
STUFFED DOLL
Samuel M. Cornell, N. Hollywood, Calif., and Robert B. Goldstein, 6950 Newgate Rd., Canoga Park, Calif. 91307, assignors to Robert B. Goldstein, Canoga Park, Calif.
Filed Dec. 7, 1982, Ser. No. 447,705
Term of patent 14 years
U.S. Cl. D21—184

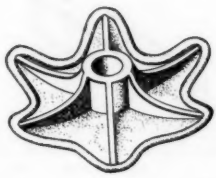


279,022
GOLF CLUB HEAD DESIGN
John A. Worster, Solano Beach; Herbert W. Lyon, Escondido; Charles D. Rambo, Escondido; Arthur F. Santy, Escondido, all of Calif., and M. Michael Foegen, New Seabury, Mass., assignors to Acushnet Company, New Bedford, Mass.
Filed Mar. 23, 1983, Ser. No. 478,143
Term of patent 14 years
U.S. Cl. D21—220



279,023
SNOW SKI TEATHER
William H. Wessels, Rt. 5, Caldwell, Id. 83605
Filed Jul. 16, 1982, Ser. No. 398,943
Term of patent 14 years
U.S. Cl. D21—230

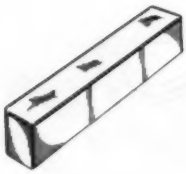
279,024
SNOW PLATE
Peter Nordgren, and Hans Sjöholm, both of Stockholm, Sweden, assignors to Formelprodukter, Lulea, Sweden
Filed Mar. 26, 1982, Ser. No. 362,312
Claims priority, application Sweden, Oct. 5, 1981, 81-2189
Term of patent 14 years
U.S. Cl. D21—230



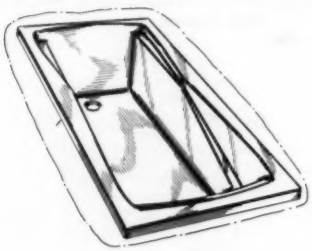
279,025
SNOW PLATE
Peter Nordgren, and Hans Sjöholm, both of Stockholm, Sweden, assignors to Formelprodukter, Lulea, Sweden
Filed Mar. 26, 1982, Ser. No. 362,314
Claims priority, application Sweden, Oct. 5, 1981, 81-2187
Term of patent 14 years
U.S. Cl. D21—230

279,026
SKI POLE GRIP
Peter Nordgren, and Hans Sjöholm, both of Stockholm, Sweden, assignors to Formelprodukter, Lulea, Sweden
Filed Mar. 26, 1982, Ser. No. 362,315
Claims priority, application Sweden, Oct. 5, 1981, 81-2185
Term of patent 14 years
U.S. Cl. D21—230

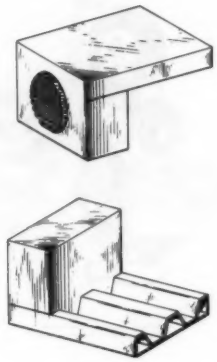
279,027
MAGNETIC FLUID CONDITIONER
Gale M. Weisenbarger, 217 E. Israel St., Eaton, Ohio 45320, and John C. Moran, 3124 Lake Ave., Fort Wayne, Ind. 46805
Filed Feb. 2, 1984, Ser. No. 576,358
Term of patent 14 years
U.S. Cl. D23—3



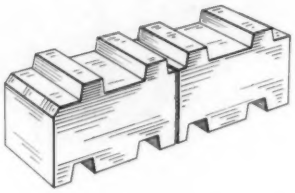
279,028
BATHTUB OR THE LIKE
Herbert V. Kohler, Jr., Kohler, and Donald W. Doman, Janesville, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jun. 22, 1983, Ser. No. 506,654
Term of patent 14 years
U.S. Cl. D23—55



279,029
BLOWER UNIT FOR PORTABLE HEATER
Wayne F. Sieverding, Marshalltown, Iowa, assignor to Western Manufacturing Corporation, Marshalltown, Iowa
Filed Sep. 30, 1982, Ser. No. 429,304
Term of patent 14 years
U.S. Cl. D23—155

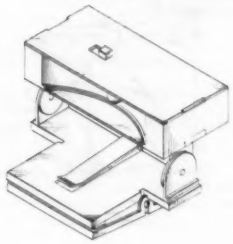


279,030
HEADER FOR CRIBBING
Angelo Risi, and Antonio Risi, both of P.O. Box 370, Gormley, Ontario, Canada L0H 1G0
Filed Sep. 8, 1982, Ser. No. 398,290
Claims priority, application Canada, Jun. 24, 1982, 24-06-82-2
Term of patent 14 years
U.S. Cl. D25—80



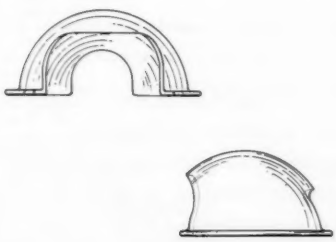
279,031
FLUORESCENT LAMP
Masumi Suzuki, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Nov. 29, 1982, Ser. No. 445,040
Term of patent 14 years
U.S. Cl. D26—3

279,032
BOOKLIGHT
John S. Doyel, 404 W. 20th St., New York, N.Y. 10011
Filed Sep. 30, 1982, Ser. No. 431,199
Term of patent 14 years
U.S. Cl. D26—60

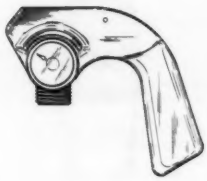


279,033
HANDLE FOR A CURLING IRON OR STYLER
Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Redken Laboratories, Inc., Canoga Park, Calif.
Filed Jul. 30, 1982, Ser. No. 403,552
Term of patent 14 years
U.S. Cl. D28—35

279,034
MANICURIST'S FINGER NAIL CLIPPING SHIELD
Mark R. Putney, 5898 Fishburne Dr., San Jose, Calif. 95123
Filed May 6, 1983, Ser. No. 492,353
Term of patent 14 years
U.S. Cl. D28—56



279,035
FIRE EXTINGUISHER HEAD ASSEMBLY
Ronald E. Braswell, P.O. Box 110008, Arlington, Tex. 76011
Filed Nov. 1, 1982, Ser. No. 438,022
Term of patent 14 years
U.S. Cl. D29—5



279,036
STIRRUP STRAP FOR MOUNTING A HORSE
Joseph B. Ludwig, Raytown, Mo., assignor to Gary D. Fletcher, Lee's Summit, Mo., a part interest
Filed Dec. 29, 1982, Ser. No. 454,437
Term of patent 14 years
U.S. Cl. D30—30

279,037

CONTAINER FOR STORING BRUSHES OR THE LIKE

Jacob P. Schuler, Kerkpad Noordzijde 43, AH Soest, Netherlands

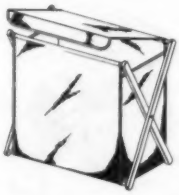
Filed Sep. 30, 1982, Ser. No. 430,131
Claims priority, application Benelux, Jan. 4, 1982, 56739-00
Term of patent 14 years
U.S. Cl. D32—35

279,038

CLOTHES HAMPER

Cloud H. Thompson, Jr., Burlington, Iowa, assignor to Burlington Basket Company, Burlington, Iowa

Filed Dec. 27, 1983, Ser. No. 565,725
Term of patent 14 years
U.S. Cl. D32—37

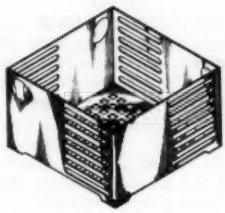


279,039

STORAGE CONTAINER FOR SPORTS ACCESSORIES

Eddie R. Walden, 2601 Tiller, Pt. Hueneme, Calif. 93401

Filed Sep. 24, 1982, Ser. No. 422,896
Term of patent 14 years
U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.N.F. Industrie: *See*—
Vacher, Pierre, 4,519,329, Cl. 105-218.00A.

AB Grindex: *See*—
Bjorklund, Bengt, 4,519,615, Cl. 277-92.000.

AB Hedemora Verkstalder: *See*—
Ragnegard, Samuel; Strid, Kent; and Sundkvist, Goran, 4,519,910, Cl. 210-327.000.

AB Volvo: *See*—
Schlicker, Heinrich A., 4,519,483, Cl. 192-4.00A.

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Kitamura, Kazuhiko, 4,519,369, Cl. 123-337.000.

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De Jong, Jan I., 4,519,897, Cl. 208-74.000.

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Kitch, Paul E.; Crochetiere, Raymond H.; Gudmundson, Gunnar G.; and Hadank, Walter R., 4,519,688, Cl. 354-297.000.

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Aberle, Leonard J.; Kim, Dong W.; Lees, Robert; Vermeer, Dick C.; Wohnig, Ernest W.; and Yates, Samuel L., 4,519,116, Cl. 28-257.000.
Brush, Robert W., Sr.; and Shepler, Eric F., 4,519,661, Cl. 339-89.00M.
Fulmer, Keith H., 4,519,295, Cl. 91-376.00R.
Gualtieri, Devlin M.; and Tumelty, Paul F., 4,520,460, Cl. 365-33.000.
Johnson, Edwin A.; and Leung, Chun K., 4,520,449, Cl. 364-559.000.
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Williams, Robert L.; and Marks, Christopher, 4,519,666, Cl. 339-177.00R.

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Russell, Derek V., 4,519,177, Cl. 52-745.000.

Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger; Hollyday, Robert D.; and Kling, John P., to AMP Incorporated. Solderless mounted filtered connector. 4,519,665, Cl. 339-147.00R.

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LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
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McAllister, Don M., 4,519,357, Cl. 123-539.000.

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Tsutsumi, Akira, 4,520,261, Cl. 250-203.00R.

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Luzzi, Glenn J.; and Kominiak, Andrew A., 4,520,229, Cl. 174-73.00R.

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Gallagher, Terence J.; and LaCapria, Anthony, 4,519,155, Cl. 40-625.000.

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Buzby, George C., Jr., 4,520,205, Cl. 548-491.000.
Wei, Peter H. L., 4,520,196, Cl. 544-285.000.

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Kronstein, Max; and Eichberg, Joseph, 4,520,153, Cl. 524-145.000.

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Moynihan, John T., 4,519,841, Cl. 106-27.000.

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De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.
Schoeff, Terry G.; and Hemmert, Raymond A., deceased, 4,519,376, Cl. 126-121.000.

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Chow, Yechow T., 4,520,453, Cl. 364-900.000.
Latimer, Stanley M.; and Orton, Gregory A., 4,520,414, Cl. 360-125.000.

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Andersen, Jorgen, to Radiometer A/S. Syringe for collecting a liquid sample. 4,519,402, Cl. 128-765.000.

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Nakatsugawa, Kenji; and Itaya, Hiroshi, 4,520,321, Cl. 328-133.000.

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Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,520,176, Cl. 524-598.000.
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Peckels, Jean; and Schaaf, Antoine, 4,519,587, Cl. 266-80.000.
Archer, Michael A., to Lucas Industries, public limited company. Control system for a fuel supply system. 4,519,351, Cl. 123-357.000.
Archibald, James B.; and Eats, James V., to General Electric Company. Braid clamp for generator shaft voltage and current pickup. 4,519,669, Cl. 339-274.000.
Arena, Blaise J., to UOP Inc. Immobilization of organic species on refractory inorganic oxides. 4,520,122, Cl. 502-152.000.
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Holland, Ronald A.; Petrie, Harold L.; Brennan, John R.; and Christ, Frederick C., 4,519,457, Cl. 166-317.000.
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Lepper, Eberhard; and Lust, Karl-Heinz, 4,520,296, Cl. 318-254.000.
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Uesugi, Kenji; Irie, Shin-ichi; Asada, Yoshihisa; Maeda, Masahiro; Yamada, Nobuyuki; and Nakagawa, Hideaki, 4,520,230, Cl. 174-107.000.
Asahi-Dow Limited: *See*—
Yoshino, Akira; and Iwami, Isamu, 4,520,072, Cl. 428-403.000.
Asaida, Takashi, to Sony Corporation. Color video signal processing apparatus. 4,520,386, Cl. 358-13.000.
Asch, Karl; Greschner, Johann; Kallmeyer, Michael; and Kulcke, Werner, to International Business Machines Corporation. Probe head arrangement for conductor line testing with at least one probe head comprising a plurality of resilient contacts. 4,520,314, Cl. 324-158.00P.
Ashland Oil, Inc.: *See*—
Hupp, Stephen S., 4,520,206, Cl. 548-548.000.
Associated Electrical Industries Limited: *See*—
Ward, Philip A., 4,520,303, Cl. 318-778.000.
AT&T Bell Laboratories: *See*—
Boettcher, Charles W., Jr.; Hamilton, Billy H.; Slak, William M.; and Zweig, Walter L., 4,520,437, Cl. 363-41.000.
Curtis, Lyn; and Young, William C., 4,519,671, Cl. 350-96.150.
Wen, Wilson K., 4,520,477, Cl. 370-58.000.
AT&T Information Systems Inc.: *See*—
Wei, Lee-Fang, 4,520,490, Cl. 375-27.000.
AT&T Technologies, Inc.: *See*—
Kleinedler, Gary E.; and Pohl, Herbert A., 4,519,132, Cl. 29-845.000.
Tucker, John G., 4,519,552, Cl. 242-7.170.
Ateliers Reunis: *See*—
Levy-Joseph, Marc, 4,519,622, Cl. 280-33.995.
Athey, Graham, to Imperial Chemical Industries, PLC. Polyester fibrefill blend. 4,520,066, Cl. 428-288.000.
Athmer, F.: *See*—
Cronenberg, Dieter-Julius; and Faflek, Jeno , 4,519,165, Cl. 49-307.000.
Atkinson, Robert W.; Elliott, Joseph W.; and Johnson, Donald W., to Snyder Laboratories, Inc. Lavage handpiece. 4,519,385, Cl. 128-66.000.
Atlantic Richfield Company: *See*—
Schuh, Frank J., 4,519,463, Cl. 175-61.000.
Audi NSU Auto Union Aktiengesellschaft: *See*—
Leitermann, Wulf; and Heneka, Rolf, 4,519,646, Cl. 297-15.000.
Austin Rover Group Limited: *See*—
Randle, James N., 4,519,628, Cl. 280-701.000.
Automatic Liquid Packaging, Inc.: *See*—
Weiler, Gerhard H.; and Pagels, Louis T., 4,519,513, Cl. 215-32.000.
Automobiles Peugeot/Automobiles Citroen: *See*—
Sedille, Marcel; and Le Creurer, Maurice, 4,519,211, Cl. 60-602.000.
Ava International Corporation: *See*—
Akkerman, Neil H.; and Dewey, Daniel O., 4,519,575, Cl. 251-58.000.
Axelrod, Robert J., to General Electric Company. Flame retardant composition of polyphenylene ether, styrene resin and cyclic phosphonate. 4,520,152, Cl. 524-120.000.
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, to Canon Kabushiki Kaisha. Droplet generating method and apparatus therefor. 4,520,373, Cl. 346-140.00R.
B. F. Goodrich Company, The: *See*—
Ahmad, Shamim; and Schaefer, Ronald J., 4,519,430, Cl. 152-209.00R.
Chasar, Dwight W., 4,520,151, Cl. 524-101.000.
Fisher, John M., 4,519,782, Cl. 441-40.000.
B & H Technologies, Inc.: *See*—
Baumberg, Iosif, 4,519,749, Cl. 417-158.000.
Babcock & Wilcox Company, The: *See*—
Lindstrom, Gerald D.; Eckhart, Clifford F.; Farthing, George A., Jr.; Muckley, James J.; and Taylor, Brian E., 4,519,322, Cl. 110-264.000.
Badesha, Santokh S.; and Abkowitz, Martin A., to Xerox Corporation. Process for modifying the electrical properties of selenium, and selenium alloys. 4,520,010, Cl. 427-83.000.
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, to BASF Aktiengesellschaft. Catalyst for the preparation of methyl methacrylate. 4,520,125, Cl. 502-170.000.
Baker, Donal E., to Westinghouse Electric Corp. Electronic phase detector having an output which is proportional to the phase difference between two data signals. 4,520,319, Cl. 328-133.000.
Baker, Jay S., to Ampex Corporation. Zero-delay ramp generator. 4,520,276, Cl. 307-228.000.
Baker Oil Tools, Inc.: *See*—
Le, Tam D.; and Turner, Weems D., 4,519,262, Cl. 74-89.200.
Baldwin, Roger A.; Stauter, John C.; Kauffman, Jim W.; and Laughlin, William C., to Kerr-McGee Corporation. Process for the removal and recovery of selenium from aqueous solutions. 4,519,913, Cl. 210-611.000.
Baldwin, Roger A.: *See*—
Kauffman, Jim W.; Laughlin, William C.; and Baldwin, Roger A., 4,519,912, Cl. 210-611.000.
Baldwin, Samuel L., to General Electric Company. Orientable refractor mounting. 4,520,435, Cl. 362-311.000.
Ballas, John S., Jr.: *See*—
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., 4,519,396, Cl. 128-698.000.
Bamberg, Joe T.: *See*—
Kohn, Gustave K.; and Bamberg, Joe T., 4,520,199, Cl. 546-302.000.
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Data processing system. 4,520,441, Cl. 364-200.000.

Bar-Yonah, Yitzchak. Selectively light transmitting panel. 4,519,675, Cl. 350-259.000.

Barabas, Eugene S.; and Cho, James R., to GAF Corporation. Preparation of vinylpyrrolidone/vinyl acetate copolymers of various molecular weights using a single initiator system consisting essentially of t-Butylperoxypivalate. 4,520,179, Cl. 526-212.000.

Barabas, Eugene S.; and Cho, James R., to GAF Corporation. Polymerization of vinylpyrrolidone to various molecular weights using a single initiator system consisting essentially of t-Butylperoxypivalate. 4,520,180, Cl. 526-212.000.

Baranowski, Thomas J., Jr.: *See*—
Black, Jonathan; and Baranowski, Thomas J., Jr., 4,519,394, Cl. 128-419.00F.

Barauke, Norbert, to Spindelfabrik Sussen, Schurr, Stahlecker & Grill GmbH. Device for interrupting the feed of a roving to the drawing frames of a spinning machine. 4,519,199, Cl. 57-87.000.

Barbier, Jean P.: *See*—
Rialland, Jean P.; and Barbier, Jean P., 4,520,036, Cl. 426-271.000.

Bardong, Helmut: *See*—
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,519,120, Cl. 29-157.00R.

Barker, Robert B.; Davidge, Ronald V.; Gibson, David K.; and Van Cleave, George W., to International Business Machines Corporation. Electronically gated paper aligner system. 4,519,700, Cl. 355-3.0SH.

Barmag Barmer Maschinenfabrik AG: *See*—
Dammann, Peter; Lorenz, Hellmut; and Maier, Roland, 4,519,204, Cl. 57-340.000.
Schippers, Heinz, 4,519,203, Cl. 57-328.000.

Barna, Gordon L.; and Lippert, James W., to Kaiser Aluminum & Chemical Corporation. Heat exchange structure. 4,519,442, Cl. 165-9.200.

Barnett, Joe R., to Thermo King Corporation. Transport refrigeration system with top freezing avoidance. 4,519,215, Cl. 62-158.000.

Barr, Robert A. Positive displacement pump assembly. 4,519,712, Cl. 366-77.000.

Barr & Stroud Limited: *See*—
Hamilton, James G., 4,519,673, Cl. 350-96.320.

Barrett, Mark D.: *See*—
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,519,446, Cl. 165-101.000.

Barrett, Monroe C.: *See*—
Fachini, Robert M.; Orsborn, Jesse H.; and Barrett, Monroe C., 4,519,189, Cl. 56-16.600.

Barrois, Claus D., to Koenig & Bauer Aktiengesellschaft. Inking unit. 4,519,312, Cl. 101-349.000.

Barry, Leonard D. Rotary loader and side-coupling transfer system. 4,519,737, Cl. 414-337.000.

Bartholomaus, Reiner; and Rivolier, Michel, to Mannesmann Rexroth GmbH. Device for the actuation of a slide valve. 4,519,573, Cl. 251-30.000.

Basalay, Robert J.; West, C. Thomas; and Petrille, Dennis G., to Standard Oil Company (Indiana). Polyborate esters and their use in lubricants. 4,519,926, Cl. 252-49.600.

BASF Aktiengesellschaft: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,520,135, Cl. 521-56.000.
Schneider, Kurt; Heide, Wilfried; Hartmann, Juergen; and Hartmann, Heinrich, 4,520,210, Cl. 560-222.000.
Schumacher, Horst; and Grafen, Paul, 4,519,961, Cl. 264-4.600.

BASF Wyandotte Corporation: *See*—
Langdon, William K., 4,519,950, Cl. 260-404.000.

Bassler, Peter: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.

Batchelder, David N.: *See*—
Pitt, Gillies D.; Williamson, Roger J.; Batchelder, David N.; and Prabakaran, Arulanandam M., 4,519,259, Cl. 73-861.220.

Battelle Memorial Institute: *See*—
Arieh, Simon; and Courvoisier, Guy, 4,519,150, Cl. 36-121.000.

Bau- und Forschungsgesellschaft Thermoform AG: *See*—
Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, 4,520,105, Cl. 435-163.000.

Baum, Marcel: *See*—
Schwanbom, Erik; Frankenberger, Horst; and Baum, Marcel, 4,519,388, Cl. 128-204.250.

Baumberg, Iosif, to B & H Technologies, Inc. Wind-solar lift pump. 4,519,749, Cl. 417-158.000.

Baxter Travenol Laboratories, Inc.: *See*—
Hitchcock, James R., Jr.; and Nevens, Charles J., 4,519,795, Cl. 604-289.000.
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,519,499, Cl. 206-219.000.

Bayer Aktiengesellschaft: *See*—
Claussen, Uwe, 4,519,935, Cl. 252-299.100.
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,520,147, Cl. 524-100.000.
Hess, Heinrich; Grogler, Gerhard; and Kopp, Richard, 4,520,186, Cl. 528-73.000.
Hocker, Jurgen; Muller, Hans K.; and Broich, Bruno, 4,519,939, Cl. 252-500.000.
Martinola, Friedrich, 4,519,916, Cl. 210-678.000.
Martinola, Friedrich, 4,519,917, Cl. 210-678.000.
Schmitt, Hans-Georg; Palus, Wilfried; and Genth, Hermann, 4,520,023, Cl. 514-241.000.
Stawitz, Josef, 4,520,202, Cl. 548-416.000.
Zabrocki, Karl; Ott, Karl-Heinz; Schmidt, Adolf; and Pischtschan, Alfred, 4,520,165, Cl. 525-84.000.

Bayerische Motoren Werke AG: *See*—
Jovanovic, Nenad, 4,519,648, Cl. 297-146.000.

Bayerische Motoren Werke A.G.: *See*—
Grohmann, Kurt, 4,520,258, Cl. 219-279.000.

BBC Aktiengesellschaft Brown, Boveri & Cie.: *See*—
Klein, Erwin, 4,520,383, Cl. 357-81.000.
Klein, Erwin, 4,520,384, Cl. 357-82.000.

BBC Brown, Boveri & Company, Limited: *See*—
Gubler, Hans-Rudolf, 4,519,205, Cl. 57-406.000.
Kluge-Weiss, Petra, 4,519,850, Cl. 148-1.500.

Beall, George H.; MacDowell, John F.; and Taylor, Mark P., to Corning Glass Works. Transparent glass-ceramics containing mullite. 4,519,828, Cl. 65-33.000.

Beamenderfer, Robert E.: *See*—
Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger; Hollyday, Robert D.; and Kling, John P., 4,519,665, Cl. 339-147.00R.

Beasley, Max M.: *See*—
Green, Jerry T.; and Beasley, Max M., 4,519,326, Cl. 112-79.00R.

Beaton, Gerald V.: *See*—
Fletcher, Edwin; Beaton, Gerald V.; and Gomer, Charles R., 4,520,266, Cl. 250-357.100.

Beatty, Graydon E.: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,519,400, Cl. 128-741.000.

Beck & Co., Packautomaten: *See*—
Horn, Roland; and Glausch, Erhardt, 4,519,185, Cl. 53-550.000.

Becker, Charles A.: *See*—
Castleberry, Donald E.; and Becker, Charles A., 4,520,357, Cl. 340-783.000.

Becker, Mitchell; and Sachs, Howard M., to Halcon SD Group, Inc., The. Purification of ethylene glycol derived from ethylene carbonate. 4,519,875, Cl. 203-28.000.

Beckman, John B.; and Blickstein, Martin J., to Abet Group, The. Piezoelectric pump with internal load sensor. 4,519,751, Cl. 417-322.000.

Beckwith, Paul B.: *See*—
Chan, Luen C.; Beckwith, Paul B.; and Pearce, Jeffrey B., 4,520,506, Cl. 382-56.000.

Becton, Dickinson and Company: *See*—
Dunmire, Robert W.; Miller, Drew J.; and Johnson, Michael D., 4,519,098, Cl. 2-161.00R.

Beecham Group p.l.c.: *See*—
Newsome, Peter M.; and Mullan, Noel A., 4,520,014, Cl. 424-153.000.

Beimesch, Bruce J.: *See*—
Schnur, Nicholas E.; and Beimesch, Bruce J., 4,519,932, Cl. 252-73.000.

Beisemann, Gerd: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,519,233, Cl. 72-247.000.

Belco Pollution Control Corporation: *See*—
Gibbons, Robert E., 4,519,817, Cl. 55-112.000.

Belin, Rudolf E.; Boyce, William F.; and Feehan, John D., to Commonwealth Scientific and Industrial Research Organization. Helical wrapping of tape. 4,519,195, Cl. 57-3.000.

Bell, Ronald D.: *See*—
McGill, Eugene C.; and Bell, Ronald D., 4,519,993, Cl. 423-235.000.

Belrecolt S.A.: *See*—
Aron, Jerome; and Quirin, Michel, 4,519,194, Cl. 56-370.000.

Bendson, Steven A.: *See*—
Piotrowski, Chester; Bendson, Steven A.; Loeding, Neil W.; and Mularie, William M., 4,520,413, Cl. 360-113.000.

Berard, Alain: *See*—
Grimberg, Martine; and Berard, Alain, 4,520,442, Cl. 364-414.000.

Berard, Claude: *See*—
Laviron, Andre ; and Berard, Claude, 4,520,309, Cl. 324-73.00R.

Bercaw, Kenneth K.: *See*—
Shank, William E.; and Bercaw, Kenneth K., 4,519,722, Cl. 403-26.000.

Berdiev, Oleg S.: *See*—
Logvinov, Anatoly A.; Milov, Vladimir N.; Ostrenko, Nikolai S.; Demyanovich, Nikolai A.; Antonov, Vladimir A.; Abdulin, Fen Z.; and Berdiev, Oleg S., 4,519,437, Cl. 164-284.000.

Berg, Daniel T., to Motorola, Inc. Duplex communication transceiver with modulation cancellation. 4,520,475, Cl. 370-24.000.

Berg, Roy C.; Malloy, Thomas P.; and Vora, Bipin V., to UOP Inc. Production of dialkylated aromatics. 4,520,218, Cl. 585-449.000.

Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, to Rhone-Poulenc Industries. Cephalosporin derivatives. 4,520,193, Cl. 544-016.000.

Bergren, Orton D.: *See*—
Parkinson, Dean B.; and Bergren, Orton D., 4,519,632, Cl. 283-75.000.

Bernardoni, Luigi; and D'Angelo, Domenico, to Alfa Romeo Auto S.p.A. Intake system for an internal combustion engine provided with several intake valves. 4,519,363, Cl. 123-432.000.

Bernhard, Dennis P.; Rowles, Howard C.; and Teichman, Robert L., to Air Products and Chemicals, Inc. Process for recovering C_4+ hydrocarbons using a dephlegmator. 4,519,825, Cl. 62-28.000.

Berni, Albert J., to Shell Oil Company. Marine seismic system. 4,520,467, Cl. 367-24.000.

Bernicot, Michel: *See*—
Chaouloff, Michel; Bernicot, Michel; Douineau, Pierre; and Boret, Roger, 4,519,416, Cl. 137-488.000.

Berry, Michael J.: *See*—
Reddy, Kammalathinna V.; and Berry, Michael J., 4,519,882, Cl. 204-158.00R.

Bertelson, Peter C.: *See*—
Bush, John W.; and Bertelson, Peter C., 4,519,591, Cl. 267-148.000.

Bertram, Rick V., to Union Oil Company of California. Process for recovering carbonaceous and sulfur-containing particles from a retort. 4,519,874, Cl. 201-39.000.

Bertz, Hans-Ulrich: *See*—
Meder, Willi; Bertz, Hans-Ulrich; and Golder, Peter, 4,519,141, Cl. 33-179.50R.

Bethmann, Karl W.; and Theis, Ulrich. Ammunition, preferably for machine cannons, including a projectile equipped with a tracer, with the lethal range of the projectile being limited if the target is missed. 4,519,316, Cl. 102-513.000.

Bevilaqua, Paul M.; and Stachura, Stanley J., to Rockwell International Corporation. Spray dryer for the purification of a gas. 4,519,990, Cl. 423-210.000.

Bevington, John F.; Meeker, Paul; and Savidge, Michael, to National Super Service Company, The. Muffled vacuum cleaner. 4,519,112, Cl. 15-326.000.

Bewersdorf, Elmer: *See*—
McCain, William B.; and Bewersdorf, Elmer, 4,519,598, Cl. 270-53.000.

Bianchi, Giuseppe: *See*—
de Nora, Oronzio; and Bianchi, Giuseppe, 4,519,886, Cl. 204-196.000.

Bickford, Karin S.: *See*—
Staffin, H. Kenneth; Roaper, Robert B.; and Bickford, Karin S., 4,519,718, Cl. 374-45.000.

Bilofsky, Ruth C.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,520,189, Cl. 528-331.000.

Binder, George G., Jr.: *See*—
Tsao, Yuh-hwang; and Binder, George G., Jr., 4,519,452, Cl. 166-288.000.

Biosonics, Inc.: *See*—
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,519,400, Cl. 128-741.000.

Birt, David A., to Lucas Industries. Diffusion cover for a motor vehicle headlamp. 4,520,434, Cl. 362-309.000.

Biswas, Ranjit, to Thomas & Betts Corporation. Electronic package assembly and accessory component therefor. 4,519,658, Cl. 339-17.0CF.

Bjorklund, Bengt, to AB Grindex. Shaft seal device. 4,519,615, Cl. 277-92.000.

Black, Jonathan; and Baranowski, Thomas J., Jr., to University of Pennsylvania, Trustees of the. Method and apparatus for cathodic potential control in electrically induced osteogenesis. 4,519,394, Cl. 128-419.00F.

Blakeslee, Edward A., to Sperry Corporation. Inter-trolley latch for draper header. 4,519,190, Cl. 56-181.000.

Blakeslee, Gerald A., to Blakeslee, Gerald A., Jr. Firemen's tool mounting assembly. 4,519,892, Cl. 206-223.000.

Blakeslee, Gerald A., Jr.: *See*—
Blakeslee, Gerald A., 4,519,892, Cl. 206-223.000.

Blanc, Claude: *See*—
Oliveau, Olivier; and Blanc, Claude, 4,519,991, Cl. 423-220.000.

Blanck, James R. Apparatus for closing toilet seat cover. 4,519,105, Cl. 4-661.000.

Blank, Werner J.; and Parekh, Girish G., to American Cyanamid Co. Hydroxyalkyl carbamate diluent for coating compositions and compositions containing the same. 4,520,167, Cl. 525-131.000.

Blickstein, Martin J.: *See*—
Beckman, John B.; and Blickstein, Martin J., 4,519,751, Cl. 417-322.000.

Blumer, Roger L.: *See*—
Kotian, Vijayraj M.; Blumer, Roger L.; and Herbert, William J., 4,520,260, Cl. 219-553.000.

Blumle, Rudi. Method for fabricating a master plate and a master plate fabricated thereby having fitting bores disposed at prespecified coordinate intervals. 4,520,060, Cl. 428-131.000.

Bocchini, William R.: *See*—
De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.

Bock, Jan: *See*—
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,520,182, Cl. 526-307.200.

Bock Products, Inc.: *See*—
Weber, Randall W.; and Weber, Charles A., 4,519,677, Cl. 350-637.000.

Boden, Richard M.: *See*—
Fujioka, Futoshi; Boden, Richard M.; Schreiber, William L.; Whelan, Patrick; and Hanna, Marie R., 4,519,943, Cl. 252-522.00R.

Bodenseewerk Geratetechnik GmbH: *See*—
Seeger, G. Hans J.; Giesenberg, Peter; and Steimel, Johannes, 4,519,291, Cl. 89-1.806.

Boeckman, Paul A.; and Young, Dennis L., to Dover Corporation. High pressure cam seal valve. 4,519,578, Cl. 251-163.000.

Boehm, Peter: *See*—
Entwistle, Ian D.; and Boehm, Peter, 4,520,007, Cl. 424-17.000.

Boeing Company, The: *See*—
Carpenter, Paul E.; Fisher, Charles B.; and Peash, Douglas E., 4,520,424, Cl. 361-383.000.
Dontscheff, Helmut, 4,519,285, Cl. 83-880.000.
Ishimitsu, Kichio K.; and Tinoco, Edward N., 4,519,560, Cl. 244-45.00R.

Boettcher, Charles W., Jr.; Hamilton, Billy H.; Slak, William M.; and Zweig, Walter L., to AT&T Bell Laboratories. Power conversion circuit for synthesizing a sinewave with programmed amplitude control. 4,520,437, Cl. 363-41.000.

Bogossian, Armen: *See*—
De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.

Bolhuis, Pieter J., to U.S. Philips Corporation. Step-wise dimmer control circuit for a discharge lamp. 4,520,295, Cl. 315-291.000.

Boliden Aktiebolag: *See*—
Petersson, Stig A.; and Waara, Ulf C., 4,520,003, Cl. 423-533.000.

Bolli, Hans-Ulrich, to SIG - Schweizerische Industrie-Gesellschaft. Apparatus for separating and conveying objects. 4,519,495, Cl. 198-486.000.

Bollinger, Karl, to Soletanche. Scaffolding. 4,519,475, Cl. 182-17.000.

Boman, Hans G.: *See*—
Hultmark, Dan; Steiner, Hakan; Rasmuson, Torgny; and Boman, Hans G., 4,520,016, Cl. 514-12.000.

Bonner, James F., to Phytogen. Controlled growth of mung bean sprouts. 4,519,163, Cl. 47-58.000.

Bonnerot, Georges: *See*—
Raulin, Jean M.; and Bonnerot, Georges, 4,520,491, Cl. 375-27.000.

Booth, Darcy L. Securing mechanism for container components and the like. 4,519,498, Cl. 206-214.000.

Boots Company PLC, The: *See*—
Stenzenberger, Horst, 4,520,145, Cl. 523-500.000.

Boret, Roger: *See*—
Chaouloff, Michel; Bernicot, Michel; Douineau, Pierre; and Boret, Roger, 4,519,416, Cl. 137-488.000.

Borland, William, to Engelhard Corporation. Ceramic multilayer electrical capacitors. 4,520,422, Cl. 361-305.000.

Borroni, Andrea, to Societa Cavi Pirelli S.p.A. Method and apparatus for laying-up cores of a multi-core electric cable. 4,519,197, Cl. 57-64.000.

Bosschaerts, Jacobus H.: *See*—
Bruyndonckx, Jan J.; and Bosschaerts, Jacobus H., 4,519,696, Cl. 355-14.00D.

Bottero S.p.A.: *See*—
Ghinamo, Leonardo, 4,519,139, Cl. 33-32.00C.

Botyan, Viktor V.: *See*—
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; and Postnikov, Viktor M., 4,519,230, Cl. 72-56.000.

Boulle, Franck; and Zveguintzoff, Michel, to Societe Anonyme Saunier Duval eau Chaude Chauffage - S.D.E.C.C. Sealed gas heater with forced draft and regulation by microprocessor. 4,519,540, Cl. 237-7.000.

Bourgeois, Hector S.: *See*—
Rosman, Irwin E.; and Bourgeois, Hector S., 4,519,745, Cl. 416-96.00A.

Bower, Terry F.: *See*—
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,519,118, Cl. 29-121.500.

Boyce, Pamela J.: *See*—
Willis, Stephen B.; and Boyce, Pamela J., 4,519,843, Cl. 106-90.000.

Boyce, William F.: *See*—
Belin, Rudolf E.; Boyce, William F.; and Feehan, John D., 4,519,195, Cl. 57-3.000.

Boyd, Jeanette D. Teaching tool. 4,519,781, Cl. 434-156.000.

Boyd, Roger L.: *See*—
Bravenec, Thomas H.; Boyd, Roger L.; and Ferenc, Robert R., 4,519,974, Cl. 264-279.000.

Brachet, Alain; Figuet, Jacques; Guidez, Joel; and Lions, Noel, to Commissariat a l'Energie Atomique. Secondary heat transfer circuit for a nuclear reactor. 4,519,978, Cl. 376-307.000.

Brachthauser, Karl-Heinz: *See*—
Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, 4,520,105, Cl. 435-163.000.

Bradler, Hans J.; Brauner, Wilfried; Deyhle, Manfred; and Vogt, Karl H., to International Business Machines Corporation. Device for two-sided application of foils or similar material onto plate-shaped workpieces, and method of operating the same. 4,519,865, Cl. 156-256.000.

Braid, Milton, to Mobil Oil Corporation. Lubricant compositions containing N-tertiary alkyl benzotriazoles. 4,519,928, Cl. 252-50.000.

Braun, Kenneth H.: *See*—
Perlmutter, Michael S.; and Braun, Kenneth H., 4,519,708, Cl. 356-350.000.

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Bradler, Hans J.; Brauner, Wilfried; Deyhle, Manfred; and Vogt, Karl H., 4,519,865, Cl. 156-256.000.

Bravenec, Thomas H.; Boyd, Roger L.; and Ferenc, Robert R., to LTV Aerospace and Defense Company. Method and apparatus for applying a sealant to exposed fasteners. 4,519,974, Cl. 264-279.000.

Bredenkamp, Gordon L.; and Van Rhyn, Pierre, to Crucible Societe Anonyme. High frequency self-oscillating welding apparatus. 4,520,255, Cl. 219-130.100.

Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., to Biosonics, Inc. Method for stimulating salivation. 4,519,400, Cl. 128-741.000.

Brennan, John R.: *See—*
Holland, Ronald A.; Petrie, Harold L.; Brennan, John R.; and Christ, Frederick C., 4,519,457, Cl. 166-317.000.

Bressand, Rene ; and Desarmaux, Pierre, to Salomon S.A. Device for adjusting the longitudinal position of a safety binding for ski. 4,519,624, Cl. 280-633.000.

Brestel, Ronald R.; and Meyer, Dale L., to Fisher Controls, International, Inc. Cam valve self-centering seat. 4,519,579, Cl. 251-172.000.

Bretz, Gregory T.: *See—*
Crosbie, Gary M.; and Bretz, Gregory T., 4,519,967, Cl. 264-86.000.

Bridgestone Tire Company Limited: *See—*
Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,519,431, Cl. 152-209.00R.

Briggs & Stratton Corp.: *See—*
Santi, John D., 4,520,288, Cl. 310-194.000.

Brigham, William D.; and Dung, Nguyen D., to Zwick Energy Research Organization, Inc. Ambient air heated electrically assisted cryogen vaporizer. 4,519,213, Cl. 62-52.000.

Brinkers, Edith L. C. Container, in particular for a codicil or similar personal document. 4,519,497, Cl. 206-37.000.

Bristol-Myers Company: *See—*
Hoshi, Hideaki; Okumura, Jun; Naito, Takayuki; Abe, Yoshio; and Aburaki, Shimpei, 4,520,022, Cl. 514-200.000.
Lowe, David A.; Romancik, Guna; Cappelletti, Leonardo M.; and Elander, Richard P., 4,520,101, Cl. 435-49.000.

British Petroleum Company p.l.c., The: *See—*
Gane, Brian R.; and Howard, Philip, 4,520,118, Cl. 502-53.000.
Riddiford, Frederick A., 4,519,453, Cl. 166-303.000.

British Steel Corporation: *See—*
Fletcher, Edwin; Beaton, Gerald V.; and Gomer, Charles R., 4,520,266, Cl. 250-357.100.

Britz, Richard D., to Earthship Enterprise, Inc. Modular method of making a building structure. 4,519,176, Cl. 52-742.000.

Broich, Bruno: *See—*
Hocker, Jurgen; Muller, Hans K.; and Broich, Bruno, 4,519,939, Cl. 252-500.000.

Brokke, Mervin E.: *See—*
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,519,833, Cl. 71-100.000.

Brooker, Andrew F.: *See—*
Wills, Robert P.; and Brooker, Andrew F., 4,519,100, Cl. 3-1.900.

Brotherton, William A.; and Street, Kenneth, to Ferranti plc. Electrical circuit assemblies. 4,520,427, Cl. 361-389.000.

Brown, Paul L., to Dow Corning Corporation. Organopolysiloxane emulsifier compositions and method therefor. 4,520,160, Cl. 524-765.000.

Brubaker, John R.: *See—*
Hastings, Jerome K.; Brubaker, John R.; and Kroll, John W., 4,520,336, Cl. 337-140.000.

Brull, John J.; and Carnahan, Michael T., to AGA AB. Cryogen shot blast deflashing system with jointed supply conduit. 4,519,812, Cl. 51-422.000.

Brunswick, Robert, to Wrightcel Limited. Liquid filling apparatus. 4,519,184, Cl. 53-503.000.

Brush, Robert W., Sr.; and Shepler, Eric F., to Allied Corporation. Connector assembly having an anti-decoupling mechanism. 4,519,661, Cl. 339-89.00M.

Bruyndonckx, Jan J.; and Bosschaerts, Jacobus H., to AGFA-Gevaert N. V. Xerographic copying apparatus. 4,519,696, Cl. 355-14.00D.

Buckley, Galen L.; and Panique, Kenneth. Retro-reflective prism assembly. 4,519,674, Cl. 350-102.000.

Bukoschek, Romuald L.; and Diefenbach, Gerhard, to U.S. Philips Corporation. Appliance driven by an electric motor. 4,520,286, Cl. 310-83.000.

Bulanda, John J.: *See—*
Caveney, Jack E.; Moody, Roy A.; Bulanda, John J.; and Wende, Russell E., 4,519,129, Cl. 29-749.000.

Buls, Ronald L.; and Gilcrease, James P., to Texas Eastern Engineering Ltd. Slug-catching method and apparatus. 4,519,815, Cl. 55-46.000.

Bumbera, John. Fingernail clipping device. 4,519,134, Cl. 30-28.000.

Bunno, Masayasu; Sugiura, Tsutomu; Tsuji, Masao; Harada, Hidemi; and Ichihara, Yoshihiro, to Kuraray Co., Ltd. Microbial process for producing 12α-hydroxypregna-1,4-dien-3-one-20α-carboxylic acid. 4,520,102, Cl. 435-61.000.

Buonomo, Joseph P.; and Perry, Wendell L., to International Business Machines Corporation. Test verification of processor architecture having a partial instruction set. 4,520,440, Cl. 364-200.000.

Burghardt, Stanley M. Method of positioning a U-bolt on a conduit. 4,519,124, Cl. 29-526.00R.

Burke, Earl P., Jr. Swimmer's restraining apparatus. 4,519,783, Cl. 441-117.000.

Burkhardt, James L.; and McCann, John J., to Polaroid Corporation. Processor for enhancing video signals for photographic reproduction. 4,520,403, Cl. 358-332.000.

Burr, Bruce H., to Hughes Tool Company. Earth boring bit with pressure compensating bearing seal. 4,519,719, Cl. 384-94.000.

Burrell, Lynn M. Interchangeable jewelry having securing means. 4,519,220, Cl. 63-29.00R.

Burrington, James D.; Pesa, Fred A.; Maher, Elizabeth A.; and Grasselli, Robert K., to Standard Oil Company, The. Leach resistant catalyst useful for the dimerization of acrylic compounds. 4,519,954, Cl. 260-465.80D.

Burroughs Corporation: *See—*
Loskorn, Richard A., 4,520,452, Cl. 364-900.000.
Norell, Ronald A., 4,519,760, Cl. 425-113.000.
Schwartz, Sidney J., deceased, 4,520,459, Cl. 365-15.000.

Bush, John W.; and Bertelson, Peter C. Non-metallic leaf spring structure. 4,519,591, Cl. 267-148.000.

Bussjager, Rudy C.; and Del Toro, James J., to Carrier Corporation. Method and apparatus for regulating an economizer damper using indoor fan air pressure. 4,519,539, Cl. 236-13.000.

Bustos, Rafael T.: *See—*
Gullett, Edwin P.; Davis, Gerald B.; and Bustos, Rafael T., 4,519,508, Cl. 211-59.200.

Butler, James R.: *See—*
Watson, James M.; Butler, James R.; and Forward, Cleve H., 4,520,220, Cl. 585-467.000.

Butler, William S., to Halliburton Company. Cushioning unit shaft seal arrangement. 4,519,617, Cl. 277-153.000.

Buzby, George C., Jr., to American Home Products Corporation. Chemical resolution of (+)-2,3-dihydroindole-2-carboxylic acid. 4,520,205, Cl. 548-491.000.

Byerley, John J.; and Enns, Kurt. Processes for the recovery of cyanide from aqueous thiocyanate solutions and detoxication of aqueous thiocyanate solutions. 4,519,880, Cl. 204-91.000.

C-I-L Inc.: *See—*
Jorgenson, Gordon K., 4,519,314, Cl. 102-313.000.

Cable Electric Products, Inc.: *See—*
Schwartz, Frederic W., 4,520,239, Cl. 191-12.400.

Cable Technology Laboratories, Inc.: *See—*
Katz, Carlos; and Zidon, Amicam C., 4,519,759, Cl. 425-97.000.

Cahalan, Patrick T.; Jevne, Allan H.; and Fogt, Eric J., to Medtronic, Inc. Ion selective membranes for use in ion sensing electrodes. 4,519,973, Cl. 264-267.000.

Calgon Carbon Corporation: *See—*
Wells, Bruce D.; and Ferguson, Du'Bois J., 4,519,985, Cl. 423-6.000.

Cameron, Frank L., to Westinghouse Electric Corp. Boric acid expulsion fuse. 4,520,337, Cl. 337-275.000.

Cameron Iron Works, Inc.: *See—*
Grazioli, Angal J., 4,519,412, Cl. 137-72.000.

Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., to William H. Rorer, Inc. Bicyclic nitrogen heterocyclic ethers and thioethers, and their pharmaceutical uses. 4,520,025, Cl. 514-275.000.

Campbell, Jesse L.; Fennema, Alan A.; Henderson, Robert B.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., to International Business Machines Corporation. Multiple spindle winding apparatus. 4,519,553, Cl. 242-56.00R.

Campbell, Jules D., Jr., to Motorola, Inc. Code conversion circuit. 4,520,347, Cl. 340-347.0DD.

Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources: *See—*
George, Albert E.; and Poirier, Marc-Andre, 4,519,915, Cl. 210-663.000.

Cannella, Vincent D.: *See—*
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,519,339, Cl. 118-718.000.

Canning, Terry D.; and Hovan, Francis E., to Rockwell International Corporation. Electrical connector. 4,519,667, Cl. 339-186.00M.

Canon Kabushiki Kaisha: *See—*
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,520,373, Cl. 346-140.00R.
Kashiwagi, Kazuo; and Toda, Takao, 4,519,694, Cl. 355-5.000.
Kitamura, Takashi, 4,520,263, Cl. 250-223.00R.
Koumura, Noboru, 4,520,400, Cl. 358-296.000.
Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, 4,519,685, Cl. 354-154.000.
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,520,340, Cl. 338-195.000.
Takeda, Hiroaki; Tanaka, Kano; and Murata, Shinji, 4,519,697, Cl. 355-14.00R.

Cantrell, John L.: *See—*
Ribi, Edgar E.; Cantrell, John L.; and Schwartzman, Steven M., 4,520,019, Cl. 424-195.100.

Canusa Coating Systems Limited: *See—*
Hansen, Ralph H., 4,520,146, Cl. 524-94.000.

Cappelletti, Leonardo M.: *See—*
Lowe, David A.; Romancik, Guna; Cappelletti, Leonardo M.; and Elander, Richard P., 4,520,101, Cl. 435-49.000.

Carden, Danny P.: *See—*
Starnes, Ralph E., Jr.; and Carden, Danny P., 4,519,131, Cl. 29-825.000.

Cargill Detroit Corp.: *See—*
Colonius, Ray E.; and Early, Edward, 4,519,125, Cl. 29-558.000.

Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co.: *See—*
Gregg, Hans, 4,519,733, Cl. 409-7.000.

Carle & Montanari S.p.A.: *See—*
Ripani, Sergio, 4,519,304, Cl. 99-489.000.

Carlin, Donald B., to RCA Corporation. Multi-channel recording/playback optics for laser diode arrays. 4,520,471, Cl. 369-112.000.

Carlisle Corporation: *See—*
Resan, Stevan A., 4,519,175, Cl. 52-713.000.

Carlson, John H.: *See—*
Simmler, Lawrence W.; and Carlson, John H., 4,519,225, Cl. 70-34.000.

Carn, William R., to Chicago Bridge & Iron Company. Liquid storage tank with emergency product removal apparatus. 4,519,415, Cl. 137-318.000.

Carnahan, Michael T.: *See—*
Brull, John J.; and Carnahan, Michael T., 4,519,812, Cl. 51-422.000.

Carpenter, Paul E.; Fisher, Charles B.; and Peash, Douglas E., to Boeing Company, The. Ventilated instrument panel support rail. 4,520,424, Cl. 361-383.000.

Carrasquel, Angel R.: *See—*
Morales, Alfredo L.; Galiasso, Roberto E.; Agudelo, Maria M.; Salazar, Jose A.; and Carrasquel, Angel R., 4,520,128, Cl. 502-210.000.

Carrier Corporation: *See—*
Bussjager, Rudy C.; and Del Toro, James J., 4,519,539, Cl. 236-13.000.

Carveth, Peter: *See—*
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,519,499, Cl. 206-219.000.

Case Western Reserve University: *See—*
Ko, Wen H.; and Leung, Albert M., 4,519,401, Cl. 118-748.000.

Caspers, Friedhelm: *See—*
Rohde, Thomas; and Caspers, Friedhelm, 4,520,308, Cl. 324-58.50R.

Casperson, John R.; and Hann, Paul D. Process for production of carbon black. 4,520,000, Cl. 423-456.000.

Castleberry, Donald E.; and Becker, Charles A., to General Electric Company. Electroscopic information display and entry system with writing stylus. 4,520,357, Cl. 340-783.000.

Castro, Anthony J., to Akzona Incorporated. Microporous products. 4,519,909, Cl. 210-500.200.

Caterpillar Tractor Co.: *See—*
Adomis, Peter P., Jr.; and Martin, Millard J., 4,519,300, Cl. 92-158.000.
Satzler, Ronald L.; and Stevens, Samuel B., 4,519,654, Cl. 305-27.000.

Cauchy, Charles J. Thermoelectric generating system. 4,520,305, Cl. 322-2.00R.

Causton, Robert J., to Davy McKee (Sheffield) Limited. Annealing of high speed steel powder. 4,519,852, Cl. 148-16.000.

Cavalieri D'Oro, Enzo; and Vita, Piero, to Italtel Societa Italiana Telecomunicazioni S.p.A. Circuit component for separating and/or combining two isofrequential but differently polarized pairs of signal waves lying in different high-frequency bands. 4,520,329, Cl. 333-135.000.

Cavazza, Paolo. Toothbrush having series of bristles of different height. 4,519,111, Cl. 15-167.00R.

Caveney, Jack E.; Moody, Roy A.; Bulanda, John J.; and Wende, Russell E., to Panduit Corp. Mass termination connector tool assembly. 4,519,129, Cl. 29-749.000.

Cavero, Icilio; and Langer, Salomon, to Synthelabo. Anti-ulcer agents. 4,520,030, Cl. 514-629.000.

Cekoric, Mark E.: *See—*
Taylor, Ronald P.; Cekoric, Mark E.; Dewhurst, John E.; and Abouzahr, Saad M., 4,519,965, Cl. 264-51.000.

Celanese Corporation: *See—*
David, Lawrence D., 4,520,114, Cl. 501-12.000.

Celette, Germain, to Celette, S.A. Clamping device to be mounted on a frame or bench jig for checking any deformations of a vehicle body. 4,519,236, Cl. 72-457.000.

Celette, S.A.: *See—*
Celette, Germain, 4,519,236, Cl. 72-457.000.

Celotex Corporation, The: *See—*
Frentzel, Richard L., 4,520,140, Cl. 521-115.000.

Centre de Recherche Industrielle du Quebec: *See—*
Lam Shang Leen, Kee K., 4,519,998, Cl. 423-277.000.

Cepulis, Rimvydas L.: *See—*
Coffey, Gerald P.; Curatolo, Benedict S.; and Cepulis, Rimvydas L., 4,520,190, Cl. 528-336.000.

Certipak Corporation: *See—*
Lever, John K.; and DiVecchio, Angelo N., 4,519,182, Cl. 53-461.000.

Cerwin, Robert J., to Ethicon, Inc. Ligating clip and clip applier package. 4,519,501, Cl. 206-339.000.

Ceskoslovenska Adademie Ved: *See—*
Wichterle, Otto, 4,519,681, Cl. 351-160.00H.

Cesna, Joseph V., to Speedfam Corporation. Liquid waxless fixturing of microsize wafers. 4,519,168, Cl. 51-216.0LP.

Ceurvorst, Kenneth, to Sivyer Steel Corporation. Replaceable protective caps for spider arms of a reversible hammer mill. 4,519,551, Cl. 241-194.000.

Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; and Postnikov, Viktor M., to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR. Apparatus for sizing of tubes. 4,519,230, Cl. 72-56.000.

Chambers, William J., to Du Pont de Nemours, E. I., and Company. Photosensitive composition and method for forming a neutral black image. 4,520,093, Cl. 430-292.000.

Chan, Luen C.; Beckwith, Paul B.; and Pearce, Jeffrey B., to Harris Corporation. Method and system for compression and reconstruction of cultural data for use in a digital moving map display. 4,520,506, Cl. 382-56.000.

Chang, Yuehsiung, to Standard Oil Company (Indiana). Regeneration of alkaline treating agents. 4,519,881, Cl. 204-149.000.

Chaouloff, Michel; Bernicot, Michel; Douineau, Pierre; and Boret, Roger, to Compagnie Francaise des Petroles. Safety connection connecting a vessel containing a gas under pressure to a discharge system. 4,519,416, Cl. 137-488.000.

Chappell, Johnny L., Jr.; and Johnson, Charles. Video game protective glove. 4,519,097, Cl. 2-16.000.

Charatan, Norman. Oral hygiene device. 4,519,408, Cl. 132-89.000.

Charlot, Lincoln H., to Elint Corporation. Polarization ratiometry object detection system and method. 4,520,362, Cl. 343-361.000.

Chasar, Dwight W., to B. F. Goodrich Company, The. Tris (3,6-di-t-butyl-2-naphthyl) phosphite and compositions thereof. 4,520,151, Cl. 524-101.000.

Chattin, Jesse. Pedal telescoping device. 4,519,271, Cl. 74-594.300.

Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, to Rhone-Poulenc Specialites Chimiques. Water soluble biogum compositions and hydrosols prepared therefrom. 4,519,844, Cl. 106-209.000.

Chemische Werke Huls AG: *See—*
Michel, Klaus; and Gude, Armin, 4,519,968, Cl. 264-178.00R.

Chen, Hsing-Yeo: *See—*
van Hekken, Frans; and Chen, Hsing-Yeo, 4,520,292, Cl. 313-412.000.

Cheney, Jack E., to Schmelzer Corporation. Water ejector fuel system. 4,519,349, Cl. 123-198.00R.

Cherry Electrical Products Corporation: *See—*
Cokefair, Jon, 4,520,290, Cl. 313-15.000.

Chesebro, Donald G.; and Soychak, Francis J., to International Business Machines Corporation. Method of making a trench isolated device. 4,519,128, Cl. 29-576.00W.

Chevalier-Bultel, Jean P.: *See—*
Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Labonte, Normand, 4,519,811, Cl. 51-309.000.

Chevron Research Company: *See—*
Haas, John C., 4,519,810, Cl. 48-202.000.
Papir, Yoram S., 4,519,937, Cl. 252-500.000.
Papir, Yoram S., 4,519,938, Cl. 252-500.000.
Schroeder, Albert H.; Denisevich, Peter, Jr.; Suzuki, Shigeto; and Kurkov, Victor P., 4,519,940, Cl. 252-500.000.

Chew, Remedios K.: *See—*
Pastor, Ricardo C.; and Chew, Remedios K., 4,519,986, Cl. 423-19.000.

Chiarino, Dario: *See—*
Della Bella, Davide; and Chiarino, Dario, 4,520,200, Cl. 548-247.000.

Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, to Tanabe Seiyaku Co., Ltd. Method for optical resolution of DL-α-amino acid or (±)-α-phenylethanesulfonic acid. 4,519,955, Cl. 260-501.120.

Chicago Bridge & Iron Company: *See—*
Allo, Vincent F.; and Stafford, Donald C., 4,519,448, Cl. 165-118.000.
Carn, William R., 4,519,415, Cl. 137-318.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt.: *See—*
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.

Cho, James R.: *See—*
Barabas, Eugene S.; and Cho, James R., 4,520,179, Cl. 526-212.000.
Barabas, Eugene S.; and Cho, James R., 4,520,180, Cl. 526-212.000.

Chow, Yechow T., to Ampex Corporation. Address transformation system having an address shuffler. 4,520,453, Cl. 364-900.000.

Christ, Frederick C.: *See—*
Holland, Ronald A.; Petrie, Harold L.; Brennan, John R.; and Christ, Frederick C., 4,519,457, Cl. 166-317.000.

Christopher, Hans-Gunther, to Siemens Aktiengesellschaft. Method for manufacturing a fiber-reinforced push or pull rod. 4,519,861, Cl. 156-172.000.

Chrysler Corporation: *See—*
Dolan, Courtney F.; and Woodcock, Stewart J., 4,519,265, Cl. 74-443.000.

Ciba Geigy Corporation: *See—*
Koci, Zdenek, 4,519,805, Cl. 8-650.000.
Puntener, Alois, 4,519,802, Cl. 8-404.000.
Szczepanski, Henry, 4,519,834, Cl. 71-100.000.

Claeys, Paul: *See—*
Six, Jean-Claude G.; Claeys, Paul; and Guillaume, Michel, 4,519,771, Cl. 431-25.000.

Clapp, Daniel W.: *See—*
Frazier, Donald; Daniels, J. Hartley; and Clapp, Daniel W., 4,519,512, Cl. 211-193.000.

Clare, Kenneth; and Hopkinson, Erle, to KELCO/AIL International Limited. Printing on pretreated substrates. 4,519,803, Cl. 8-445.000.

Clarion Co., Ltd.: *See—*
Itoh, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,519,269, Cl. 74-483.00R.

Clarke, Donald H., to Dow Chemical Company, The. Method for the recovery of solvent vapors. 4,519,816, Cl. 55-59.000.

Clarke, Robert T., Jr.; and Jasienski, Raymond, to Schlegel Corporation. Segmented membrane barrier. 4,519,729, Cl. 405-258.000.

Claussen, Uwe, to Bayer Aktiengesellschaft. Liquid-crystalline material containing azo dyestuffs. 4,519,935, Cl. 252-299.100.

Clay, Bobby J., to Natmar, Inc. Elastic band sealer apparatus and method for forming a continuous non-overlapping band. 4,519,857, Cl. 156-64.000.

Clayton, Anthony B.: *See—*
Diveley William R.; and Clayton, Anthony B., 4,520,171, Cl. 525-279.000.

Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., to UOP Inc. Process for separating fatty acids from unsaponifiables. 4,519,952, Cl. 260-419.000.

Clemens, Thomas G., to General Instrument Corporation. Single-stage oscillator having low-impedance feedback port. 4,520,326, Cl. 331-116.00R.

Clerici, Giordano. Pleating machine for pleating cloth with mutually converging folds. 4,519,331, Cl. 223-30.000.

Clifton, Mary F.: *See*—
Noren, Gerry K.; and Clifton, Mary F., 4,520,144, Cl. 523-435.000.

Clinch River Corporation: *See*—
Kinder, Greever C., 4,519,902, Cl. 209-234.000.

Cobe Laboratories, Inc.: *See*—
Elgas, Roger J.; and Gordon, Timothy M., 4,519,393, Cl. 128-400.000.

Cochran, Chudleigh B., to Hughes Tool Company. Continuous flow perforation washing tool and method. 4,519,456, Cl. 166-312.000.

Coffey, Gerald P.; Curatolo, Benedict S.; and Cepulis, Rimvydas L., to Standard Oil Company, The. Preparation of polyamide from dinitrile, diamine and water with P catalyst. 4,520,190, Cl. 528-336.000.

Cohen, Kenneth W., to Aerco International, Inc. Dynamically-stopped and statically-balanced valve. 4,519,422, Cl. 137-630.140.

Cohen, Marlene L., to Eli Lilly and Company. Method of selectively blocking peripheral vascular serotonergic receptors. 4,520,024, Cl. 514-255.000.

Cokefair, Jon, to Cherry Electrical Products Corporation. Gas discharge display with built-in heater. 4,520,290, Cl. 313-15.000.

Coleman, Larry M.; and Tambo, William, to Union Carbide Corporation. Waste treatment in silicon production operations. 4,519,999, Cl. 423-337.000.

Colombe , Philippe: *See*—
Metzger, Jean; Lecouls, Henri; Colombe , Philippe; and Wojcik, Jean, 4,520,001, Cl. 423-332.000.

Colonius, Ray E.; and Early, Edward, to Cargill Detroit Corp. Sucker rod coupling manufacturing system. 4,519,125, Cl. 29-558.000.

Columbus McKinnon Corporation: *See*—
Pancook, James J.; and Ulbing, Otmar M., 4,520,247, Cl. 200-298.000.

Comeau, Paul E., to Kenney Manufacturing Company. Drive sprocket for traverse rod. 4,519,433, Cl. 160-126.000.

Comment, Paul, to Favrot, Guy. Liquid spraying head. 4,519,528, Cl. 222-396.000.

Commercial Shearing, Inc.: *See*—
Petro, John D., 4,519,419, Cl. 137-596.000.
Petro, John D., 4,519,420, Cl. 137-596.000.

Commissariat a l'Energie Atomique: *See*—
Brachet, Alain; Figuet, Jacques; Guidez, Joel; and Lions, Noel, 4,519,978, Cl. 376-307.000.
Laviron, Andre ; and Berard, Claude, 4,520,309, Cl. 324-73.00R.

Common Sense Products Pty. Ltd.: *See*—
Jensen, Henning, 4,519,657, Cl. 339-15.000.

Commonwealth Scientific and Industrial Research Organization: *See*—
Belin, Rudolf E.; Boyce, William F.; and Feehan, John D., 4,519,195, Cl. 57-3.000.
Jellinek, Thomas, 4,520,143, Cl. 523-410.000.

Compagnie Francaise de Raffinage: *See*—
Marty, Claude; and Engelhard, Philippe, 4,520,225, Cl. 585-832.000.

Compagnie Francaise des Petroles: *See*—
Chaouloff, Michel; Bernicot, Michel; Douineau, Pierre; and Boret, Roger, 4,519,416, Cl. 137-488.000.

Compagnie General D'Electricite: *See*—
Lavarini, Bernard, 4,520,486, Cl. 372-95.000.

Computer Identification Systems, Inc.: *See*—
Parkinson, Dean B.; and Bergren, Orton D., 4,519,632, Cl. 283-75.000.

Conair Corporation: *See*—
Doyle, Edward J., 4,520,256, Cl. 219-225.000.

Conco Inc.: *See*—
Yoon, Heeyoung, 4,519,342, Cl. 123-3.000.

Concord, Inc.: *See*—
Gust, Jacob N., 4,519,460, Cl. 172-176.000.

Condra, Janet S.: *See*—
Russ, James J.; Smith, John W.; and Condra, Janet S., 4,519,921, Cl. 210-716.000.

Connolly, John F.: *See*—
Prater, Keith B.; Thrash, Robert J.; and Connolly, John F., 4,520,083, Cl. 429-101.000.

Container Corporation of America: *See*—
Howlett, Robert J., 4,519,319, Cl. 108-111.000.

Contemporary, Inc.: *See*—
Kanzelberger, James C., 4,520,064, Cl. 428-199.000.

Continental Can Company, Inc.: *See*—
Roth, Donald J.; Kubis, Charles S.; Walter, John; and Mohr, Glenn R., 4,519,859, Cl. 156-69.000.
Walter, John, 4,519,517, Cl. 215-253.000.

Conzelmann, Gerhard: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,519,115, Cl. 28-255.000.

Cook, Carl E. Miter board and saw guide. 4,519,280, Cl. 83-34.000.

Cook, Melvin S. Bubble-mode liquid phase epitaxy. 4,519,871, Cl. 156-622.000.

Cookerly, Jack C.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,519,286, Cl. 84-1.030.

Cooper Industries: *See*—
Furrow, Robert E., 4,519,585, Cl. 254-273.000.

Copenhafer, William C.; and Pinsky, Michael L., to Intermountain Research & Development Corp. Enhanced recovery of soda ash from aqueous sodium carbonate solutions containing Na_2SO_4- and NaCl. 4,519,806, Cl. 23-302.00T.

Cordts, Bernhard F., to Varian Associates, Inc. Ferromagnetic films for high density recording and methods of production. 4,520,040, Cl. 427-38.000.

Corning Glass Works: *See*—
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,519,828, Cl. 65-33.000.

Correlli, Antonino E. Sheet metal bending position marker system. 4,519,143, Cl. 33-189.000.

Cortellini, Conrad, to Moorfeed Corporation. Holographic imager. 4,520,387, Cl. 358-90.000.

Cosden Technology, Inc.: *See*—
Schwarz, Richard A., 4,520,136, Cl. 521-60.000.
Watson, James M.; Butler, James R.; and Forward, Cleve H., 4,520,220, Cl. 585-467.000.

Costerousse, Germain: *See*—
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,519,946, Cl. 260-239.55R.

Costruzioni Elettromagnetiche Industriali di Tagliafico Carlo: *See*—
Tagliafico, Carlo, 4,520,332, Cl. 335-126.000.

Couch, Robert P.: *See*—
St. Jacques, John W.; and Couch, Robert P., 4,519,240, Cl. 73-116.000.

Courvoisier, Guy: *See*—
Arieh, Simon; and Courvoisier, Guy, 4,519,150, Cl. 36-121.000.

Cox, Charles M.; and Heuer, Charles, to Zenith Electronics Corporation. Teletext reception indicator. 4,520,392, Cl. 358-147.000.

CPC International Inc.: *See*—
Heady, Robert E.; and Frankiewicz, Jeffrey R., 4,520,104, Cl. 435-160.000.

Crabb, Richard V., Jr., to Salinas Valley Engineering & Manufacturing, Inc. Method and apparatus for placing tags on produce and the like. 4,519,178, Cl. 53-137.000.

Cragin, Glynn P., Jr., to Mead Corporation, The. Method and apparatus for air start/stop of an ink jet printing device. 4,520,366, Cl. 346-1.100.

Craig, Arthur T.: *See*—
Moon, Joseph C.; and Craig, Arthur T., 4,519,153, Cl. 40-591.000.

Crean, Peter A.; D'Ortenzio, Remo J.; and Grow, Carolyn P., to Xerox Corporation. Printing system. 4,520,455, Cl. 364-900.000.

Creative Research and Development, Inc.: *See*—
Nezat, Jerry W., 4,520,013, Cl. 424-141.000.

Crehan, Patrick James: *See*—
Kennedy, Richard B., 4,520,139, Cl. 521-109.100.

Crochetiere, Raymond H.: *See*—
Kitch, Paul E.; Crochetiere, Raymond H.; Gudmundson, Gunnar G.; and Hadank, Walter R., 4,519,688, Cl. 354-297.000.

Cronenberg, Dieter-Julius; and Faflek, Jeno , to Athmer, F. Sealing device for the bottom of a door. 4,519,165, Cl. 49-307.000.

Crosbie, Gary M.; and Bretz, Gregory T., to Ford Motor Company. Method of making a silicon metal containing article. 4,519,967, Cl. 264-86.000.

Crossley, Anthony: *See*—
Gould, Grahame; Crossley, Anthony; and Moran, David P. J., 4,520,037, Cl. 426-330.600.

Crown Union, Inc.: *See*—
Snook, Randolph W., 4,519,303, Cl. 98-58.000.

Crucible Societe Anonyme: *See*—
Bredenkamp, Gordon L.; and Van Rhyn, Pierre, 4,520,255, Cl. 219-130.100.

Crutcher, John P., to Sencorp. Flywheel for an electro-mechanical fastener driving tool. 4,519,535, Cl. 227-131.000.

Curatolo, Benedict S.: *See*—
Coffey, Gerald P.; Curatolo, Benedict S.; and Cepulis, Rimvydas L., 4,520,190, Cl. 528-336.000.

Curran, Earl J., Jr., to Square D Company. Three phase scaling current-to-voltage convertor. 4,520,304, Cl. 318-800.000.

Curry, Kenneth D.: *See*—
Healy, George M.; and Curry, Kenneth D., 4,520,107, Cl. 435-240.000.

Curtis, Lyn; and Young, William C., to AT&T Bell Laboratories. Optical attenuator. 4,519,671, Cl. 350-96.150.

Czerlinski, George H., to Submicron, Inc. Method of and apparatus for selective localized differential hyperthermia of a medium. 4,520,249, Cl. 219-10.49R.

Daane, Robert A.: *See*—
Wittkopf, Eugene W.; Jorgensen, Allen R.; and Daane, Robert A., 4,519,757, Cl. 425-143.000.

Dahill, Robert T.; Purzycki, Kenneth L.; and Golle, Erlinda F., to Givaudan Corporation. Spirolactones as odorants. 4,519,944, Cl. 252-522.00R.

Dai-Ichi Kogyo Seiyaku Co., Ltd.: *See*—
Hori, Yuji; Nishimura, Yoshichika; and Takahashi, Fuminobu, 4,519,923, Cl. 252-8.50C.

Dai Nippon Insatsu Kabushiki Kaisha: *See*—
Hikosaka, Shinichi; Murayama, Kosho; Fukuura, Shinichi; and Yanase, Takaomi, 4,519,906, Cl. 210-223.000.

Daicel Chemical Industries Ltd.: *See*—
Namikoshi, Hajime, 4,520,192, Cl. 536-66.000.

Daimler-Benz Aktiengesellschaft: *See*—
Heinrich, Hans; and Hedrich, Dieter, 4,519,537, Cl. 228-221.000.

Daiwa Can Company, Limited: *See*—
Shimizu, Hiromichi; Kuboshima, Akira; and Tanaka, Tadashi, 4,519,310, Cl. 101-35.000.

d'Alayer de Costemore d'Arc, Stephane, to Staar S. A. Cleaning device for discs. 4,520,470, Cl. 369-72.000.

D'Alelio, Gaetano F., deceased (by St. Joseph Bank and Trust Company, executor); and Waitkus, Phillip A., to Plastics Engineering Company. Vinylacetylene-terminated polyimide derivatives. 4,520,198, Cl. 546-66.000.

Dammann, Peter; Lorenz, Hellmut; and Maier, Roland, to Barmag Barmer Maschinenfabrik AG. Yarn false twisting apparatus. 4,519,204, Cl. 57-340.000.

D'Angelo, Domenico: *See*—
Bernardoni, Luigi; and D'Angelo, Domenico, 4,519,363, Cl. 123-432.000.

Daniels, J. Hartley: *See*—
Frazier, Donald; Daniels, J. Hartley; and Clapp, Daniel W., 4,519,512, Cl. 211-193.000.

Daniels, Ted M., to Eldec Corporation. Pressure transducer including a proximity sensor. 4,519,256, Cl. 73-745.000.

Danielski, Andrew: *See*—
Hascal, Marcel; Watson, Donald A.; Danielski, Andrew; and Lopez, Sergio, 4,520,318, Cl. 324-457.000.

Danno, Yoshiaki; Kobayashi, Hiroyuki; and Fukui, Toyoaki, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Engine speed regulating system. 4,520,272, Cl. 290-40.00A.

Data Card Corporation: *See*—
Warwick, Dennis J.; Nubson, Richard C.; and Howes, Ronald B., Jr., 4,519,600, Cl. 271-4.000.

Davco Manufacturing Corporation: *See*—
Smith, Paul B., 4,519,653, Cl. 303-89.000.

David, Guy A. J.: *See*—
Grima, Jean-Claude; Pando, Bernard; and David, Guy A. J., 4,520,479, Cl. 370-84.000.

David, Lawrence D., to Celanese Corporation. Production of metastable tetragonal zirconia. 4,520,114, Cl. 501-12.000.

Davidge, Ronald V.: *See*—
Barker, Robert B.; Davidge, Ronald V.; Gibson, David K.; and Van Cleave, George W., 4,519,700, Cl. 355-3.0SH.

Davidian, Michael, to Davidian, Michael. Method of preventing corrosion of a metal casket. 4,520,043, Cl. 427-239.000.

Davis, Gerald B.: *See*—
Gullett, Edwin P.; Davis, Gerald B.; and Bustos, Rafael T., 4,519,508, Cl. 211-59.200.

Davis, Lorne A., Jr.; and Haskin, Helen K., to Texaco Inc. Two dimensional microwave chemical flood testing means and method. 4,519,982, Cl. 422-68.000.

Davy McKee (Sheffield) Limited: *See*—
Causton, Robert J., 4,519,852, Cl. 148-16.000.

Dawe, Garfield A., to Abbott Laboratories. Infusion pump system. 4,519,792, Cl. 604-152.000.

Day, James D.; and Day, James D., II. Apparatus for constructing modular pre-cast concrete buildings. 4,519,568, Cl. 249-66.00R.

Day, James D., II: *See*—
Day, James D.; and Day, James D., II, 4,519,568, Cl. 249-66.00R.

Dayco Corporation: *See*—
Long, Delmar D.; and Anderson, John F., Jr., 4,520,038, Cl. 427-26.000.

De la Rue Systems Limited: *See*—
Hunt, Steven A., 4,519,249, Cl. 73-596.000.

DeCloux, Richard J. Exercise device. 4,519,603, Cl. 272-73.000.

De Grave, Isidoor: *See*—
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,520,135, Cl. 521-56.000.

De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., to American Standard Inc. Self-contained sewage waste disposal system. 4,519,103, Cl. 4-317.000.

Deguchi, Hiroyuki: *See*—
Kurahashi, Masayuki; Kobayashi, Hisao; and Deguchi, Hiroyuki, 4,519,750, Cl. 417-270.000.

Degussa Aktiengesellschaft: *See*—
Schwarze, Werner; Kleemann, Axel; Remmel, Hans; and Hohn, Wolfgang, 4,520,209, Cl. 560-124.000.

De Jong, Jan I., to AKZO nv. Fluid cracking process using sepiolite-containing catalyst composition. 4,519,897, Cl. 208-74.000.

Del Mar Avionics: *See*—
Lisiecki, Andrew I.; and Wong, Alan S., 4,519,398, Cl. 128-710.000.

de Langre, Bruno: *See*—
Fourre, Remy; and de Langre, Bruno, 4,520,482, Cl. 371-68.000.

Della Bella, Davide; and Chiarino, Dario, to Zambon S.p.A. Isoxazole derivatives. 4,520,200, Cl. 548-247.000.

Deltakabel B.V.: *See*—
De Roo, Minno, 4,520,278, Cl. 307-253.000.

Del Toro, James J.: *See*—
Bussjager, Rudy C.; and Del Toro, James J., 4,519,539, Cl. 236-13.000.

De Luca, Paul V., to Porta Systems Corp. Wire plug assembly. 4,519,663, Cl. 339-99.00R.

Demarest, Henry M., Jr., to PPG Industries, Inc. Two stage batch liquefaction process and apparatus. 4,519,814, Cl. 65-27.000.

Demerson, Christopher A.: *See*—
Abraham, Nedumparambil A.; and Demerson, Christopher A., 4,520,203, Cl. 548-432.000.

Demus, Dietrich; Weissflog, Wolfgang; and Kresse, Horst, to VEB Werk fuer Fernsehelektronik im Kombinat Mikroelektronik. Nematic liquid crystals and method of production. 4,519,936, Cl. 252-299.630.

Demyanovich, Nikolai A.: *See*—
Logvinov, Anatoly A.; Milov, Vladimir N.; Ostrenko, Nikolai S.; Demyanovich, Nikolai A.; Antonov, Vladimir A.; Abdulin, Fen Z.; and Berdiev, Oleg S., 4,519,437, Cl. 164-284.000.

Deng, Shye-Yih. Boiler-driven power generator. 4,519,212, Cl. 60-669.000.

Denisevich, Peter, Jr.: *See*—
Schroeder, Albert H.; Denisevich, Peter, Jr.; Suzuki, Shigeto; and Kurkov, Victor P., 4,519,940, Cl. 252-500.000.

Dennison National Company: *See*—
Podosek, Edward, 4,519,629, Cl. 281-25.00A.

de Nora, Oronzio; and Bianchi, Giuseppe, to Oronzio de Nora, S.A. Method of making electrical connection to an anode. 4,519,886, Cl. 204-196.000.

Dente, Mario: *See*—
Minet, Ronald G.; Dente, Mario; Ranzi, Eliseo; and Sunny H. K., 4,520,217, Cl. 585-415.000.

Denton, Anthony D., to Ambler, Kenneth; and Raeder, Willy. Photoelectric safety screen with stray source detection. 4,520,262, Cl. 250-221.000.

Deraedt, Roger: *See*—
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,519,946, Cl. 260-239.55R.

De Roo, Minno, to Deltakabel B.V. Electronic switch. 4,520,278, Cl. 307-253.000.

DeSanto, Ronald F., to Lehigh Press, Inc., The. Folding apparatus with compound tucker blade motion. 4,519,597, Cl. 270-42.000.

Desarmaux, Pierre: *See*—
Bressand, Rene ; and Desarmaux, Pierre, 4,519,624, Cl. 280-633.000.

Deschamps, Andre ; and Franckowiak, Sigismond, to Institut Francais du Petrole. Process for converting a carbonaceous material to lower paraffinic hydrocarbons and monocyclic aromatic hydrocarbons. 4,519,895, Cl. 208-8.0LE.

DeSoto, Inc.: *See*—
Noren, Gerry K.; and Clifton, Mary F., 4,520,144, Cl. 523-435.000.

Detectors, Inc.: *See*—
Rubey, Ulyss R., 4,519,867, Cl. 156-351.000.

Deutsche Babcock Anlagen Aktiengesellschaft: *See*—
Wischniewski, Martin, 4,519,320, Cl. 110-238.000.

Dewey, Daniel O.: *See*—
Akkerman, Neil H.; and Dewey, Daniel O., 4,519,575, Cl. 251-58.000.

DewEze Manufacturing, Inc.: *See*—
Miller, Larry C., 4,519,325, Cl. 111-85.000.

Dewhurst, John E.: *See*—
Taylor, Ronald P.; Cekoric, Mark E.; Dewhurst, John E.; and Abouzahr, Saad M., 4,519,965, Cl. 264-51.000.

Deyhle, Manfred: *See*—
Bradler, Hans J.; Brauner, Wilfried; Deyhle, Manfred; and Vogt, Karl H., 4,519,865, Cl. 156-256.000.

DeYoreo, Sal G.; and Stevens, David P., to Armatron International, Inc. Apparatus for attracting insects. 4,519,776, Cl. 431-328.000.

Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, to Bayer Aktiengesellschaft. Flame-prooved polyamide moulding materials. 4,520,147, Cl. 524-100.000.

Diamond Automations, Inc.: *See*—
McEvoy, John C.; and Thomas, Leslie P., 4,519,494, Cl. 198-448.000.
Thomas, Leslie P., 4,519,505, Cl. 209-513.000.

Dickerson, Robert E., to Eastman Kodak Company. Photographic element exhibiting reduced sensitizing dye stain. 4,520,098, Cl. 430-495.000.

Dickey Natural Systems, Inc.: *See*—
Dickey, Patricia C., 4,519,340, Cl. 119-1.000.

Dickey, Patricia C., to Dickey Natural Systems, Inc. Absorbent composition for animal excreta and process for making and using same. 4,519,340, Cl. 119-1.000.

Dickhudt, Eugene A., to Medtronic, Inc. Balloon lead and inflator. 4,519,403, Cl. 128-785.000.

Dickson, John K., to Schlumberger Electronics (UK) Limited. Roller-type ultrasonic inspection device with acoustical isolation. 4,519,251, Cl. 73-639.000.

Diefenbach, Gerhard: *See*—
Bukoschek, Romuald L.; and Diefenbach, Gerhard, 4,520,286, Cl. 310-83.000.

Diesel Kiki Kabushiki Kaisha: *See*—
Sutoh, Shinji; Hara, Toshizo; and Takahashi, Akiyoshi, 4,519,443, Cl. 165-17.000.

Dietrich, Ronald J.: *See*—
Hashiguchi, Don H.; Klar, Erhard; and Dietrich, Ronald J., 4,520,130, Cl. 502-345.000.

Dietrichs, Hans-Hermann: *See*—
Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, 4,520,105, Cl. 435-163.000.

Dieupart, Michel: *See*—
Dussoliet, Jacques; and Dieupart, Michel, 4,519,554, Cl. 242-67.400.

Dillon, Paul J.; and Stumpf, Walter, to Simmons U.S.A. Corporation. Boxspring having coil compression stops. 4,519,107, Cl. 5-261.000.

Dines, Allen I.; Yeung, David; and Nacht, Sergio, to Richardson-Vicks Inc. Monohydroxy-benzoyl peroxide and compositions for treating acne. 4,520,133, Cl. 514-568.000.

Dingus, Jack D.; and Gilliam, Edward C., to Reynolds Metals Company. Can end sampler. 4,519,489, Cl. 193-31.00R.
Dinius, Richard L., to Ethyl Corporation. Absorptive structure. 4,519,798, Cl. 604-358.000.
Dinur, Eldad: *See*—
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Director-General of the Agency of Industrial Science & Technology: *See*—
Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, 4,520,162, Cl. 525-327.600.
Dischert, Robert A.; and Libbey, Robert L., to RCA Corporation. FM video transmission system having coring and coring compensation for reducing effects of triangular noise. 4,520,396, Cl. 358-167.000.
DiVecchio, Angelo N.: *See*—
Lever, John K.; and DiVecchio, Angelo N., 4,519,182, Cl. 53-461.000.
Diveley William R.; and Clayton, Anthony B., to Hercules Incorporated. Polymeric hindered amines. 4,520,171, Cl. 525-279.000.
Dr. Johannes Heidenhain GmbH: *See*—
Nelle, Gunther, 4,519,709, Cl. 356-373.000.
Schmitt, Walter, 4,519,140, Cl. 33-125.00C.
Dodson, Stuart A.: *See*—
Campbell, Henry F.; Kuhls, Donald E.; Studt, William L.; and Dodson, Stuart A., 4,520,025, Cl. 514-275.000.
Dolan, Courtney F.; and Woodcock, Stewart J., to Chrysler Corporation. Dampening shoes for synchronizer gears. 4,519,265, Cl. 74-443.000.
Dolhert, Leonard E.: *See*—
Gentilman, Richard L.; Maguire, Edward A.; and Dolhert, Leonard E., 4,520,116, Cl. 501-98.000.
Domingue, Willard A., to Fire Trumpet of America, Inc. Fire alarm system and method. 4,520,352, Cl. 340-590.000.
Dontscheff, Helmut, to Boeing Company, The. Cutting method and apparatus for tape laying machines. 4,519,285, Cl. 83-880.000.
Dooley, James J.: *See*—
Halford, Wayne R.; Renger, Larry H.; and Dooley, James J., 4,519,789, Cl. 446-444.000.
Dooling, Joe E. Oil well jack. 4,519,293, Cl. 91-178.000.
D'Ortenzio, Remo J.: *See*—
Crean, Peter A.; D'Ortenzio, Remo J.; and Grow, Carolyn P., 4,520,455, Cl. 364-900.000.
Double E Company Inc.: *See*—
Keith, Robert D., 4,519,620, Cl. 279-2.00R.
Douineau, Pierre: *See*—
Chaouloff, Michel; Bernicot, Michel; Douineau, Pierre; and Boret, Roger, 4,519,416, Cl. 137-488.000.
Dover Corporation: *See*—
Boeckman, Paul A.; and Young, Dennis L., 4,519,578, Cl. 251-163.000.
McMath, Jack A., 4,519,635, Cl. 285-93.000.
Dow Chemical, The: *See*—
Kar, Kishore K., 4,519,924, Cl. 252-35.000.
Dow Chemical Company, The: *See*—
Clarke, Donald H., 4,519,816, Cl. 55-59.000.
Skach, Edward J., Jr., 4,519,758, Cl. 425-6.000.
Stevens, Timothy S.; and Langhorst, Martin A., 4,519,905, Cl. 210-198.200.
Willis, Stephen B.; and Boyce, Pamela J., 4,519,843, Cl. 106-90.000.
Dow Corning Corporation: *See*—
Brown, Paul L., 4,520,160, Cl. 524-765.000.
Down, Michael G., to Westinghouse Electric Corp. Metal powders and processes for production from oxides. 4,519,837, Cl. 75-0.50B.
Doyle, Edward J., to Conair Corporation. Hot air curler having a remote air inlet and a slide switch and actuating arm within its handle. 4,520,256, Cl. 219-225.000.
Doyle, Rexford. Clothes-line. 4,519,509, Cl. 211-119.130.
Doyle, William D., to Felt Products Mfg. Co. High temperature resistant gasket having improved recovery characteristics. 4,519,619, Cl. 277-235.00B.
Dragerwerk A.G.: *See*—
Schwanbom, Erik; Frankenberger, Horst; and Baum, Marcel, 4,519,388, Cl. 128-204.250.
Dreese, Charles H. Log shaper. 4,519,429, Cl. 144-3.00R.
Dreher, Dieter: *See*—
Lehmann, Klaus; Dreher, Dieter; Rauch, Hubert; and Siol, Werner, 4,520,172, Cl. 525-369.000.
Drehman, Lewis E.: *See*—
McGinnis, Roger N.; Drehman, Lewis E.; and Pitzer, Emory W., 4,520,223, Cl. 585-629.000.
Dreischmeier, Wilfried: *See*—
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DuBrucq, Denyse C., to Ear Three Systems Manufacturing Company. Speech presentation system and method. 4,520,501, Cl. 381-48.000.
Duembgen, Gerd: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.
Dufour, Charles H.; and Newman, Jonathan G., to Harris Corporation. Makeready system. 4,520,454, Cl. 364-900.000.
Duijndam, Cornelis P. J.: *See*—
Zwijsen, Wilhelmus A. J. M.; Duijndam, Cornelis P. J.; and Smeulers, Wouter, 4,520,393, Cl. 358-149.000.
Dumbser, Gerhard; Lutz, Manfred; Fey, Rainer; and Weiss, Kurt, to Fichtel & Sachs AG. Control locking installation for motor vehicle doors. 4,519,227, Cl. 70-264.000.
Dung, Nguyen D.: *See*—
Brigham, William D.; and Dung, Nguyen D., 4,519,213, Cl. 62-52.000.
Dunmire, Robert W.; Miller, Drew J.; and Johnson, Michael D., to Becton, Dickinson and Company. Wearing apparel and methods for manufacturing of wearing apparel. 4,519,098, Cl. 2-161.00R.
Dunn, James M., to Verex Laboratories, Inc. Sustained released aspirin formulation. 4,520,009, Cl. 424-78.000.
Du Pont de Nemours, E. I., and Company: *See*—
Chambers, William J., 4,520,093, Cl. 430-292.000.
Hagman, John F.; and Shih, Chi-Kai, 4,520,169, Cl. 525-185.000.
Kitto, David P., 4,520,170, Cl. 525-200.000.
Ritchie, Robert J., 4,519,884, Cl. 204-181.00C.
Subramanian, Narayanan S., 4,520,183, Cl. 526-318.000.
Sundet, Sherman A., 4,520,044, Cl. 427-244.000.
Duranleau, Roger G.: *See*—
Lin, Jiang-Jen; and Duranleau, Roger G., 4,519,956, Cl. 260-549.000.
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Dyer, Thomas A., to Pentek Corporation. Turntable for roller conveyor system. 4,519,493, Cl. 198-414.000.
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Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,520,063, Cl. 428-195.000.
E-Systems, Inc.: *See*—
Keearns, Larry R., 4,520,445, Cl. 364-450.000.
E. Th. Noack Verpackungsmaschinen: *See*—
Masino, Leo, 4,519,282, Cl. 83-85.000.
Ear Three Systems Manufacturing Company: *See*—
DuBrucq, Denyse C., 4,520,501, Cl. 381-48.000.
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Colonius, Ray E.; and Early, Edward, 4,519,125, Cl. 29-558.000.
Earthship Enterprise, Inc.: *See*—
Britz, Richard D., 4,519,176, Cl. 52-742.000.
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Dickerson, Robert E., 4,520,098, Cl. 430-495.000.
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Forsell, Kenneth A.; and Mallonen, Edward A., 4,520,244, Cl. 200-67.0DA.
Hastings, Jerome K.; Brubaker, John R.; and Kroll, John W., 4,520,336, Cl. 337-140.000.
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Kroll, John W., 4,520,375, Cl. 346-140.00R.
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Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,520,135, Cl. 521-56.000.
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Edgar, Albert D.; and Lubart, Neil D., to International Business Machines Corporation. Diagonal grid image communication and display. 4,520,391, Cl. 358-133.000.
Edgren, David, to ALZA Corporation. Osmotic device with wall comprising cellulose ether and permeability enhancer. 4,519,801, Cl. 604-892.000.
Edwin Cooper, Inc.: *See*—
O'Brien, Joseph P.; and Papay, Andrew G., 4,519,929, Cl. 252-51.50A.

Efstratis, Ernest. Garbage disposal guard. 4,519,102, Cl. 4-292.000.

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Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Straubel, Max, to Robert Bosch GmbH. Controlling device for a fuel-quantity adjusting member of a fuel injection pump. 4,519,352, Cl. 123-373.000.

Eichberg, Joseph: *See—*
Kronstein, Max; and Eichberg, Joseph, 4,520,153, Cl. 524-145.000.

Eiko Shiraishi: *See—*
Shiraishi, Yoshiro, 4,519,466, Cl. 180-7.100.

Eilertsen, Jens H.; Fog, Arne D.; and Gibson, Keith, to Novo Industri A/S. Liquid enzyme concentrates containing alpha-amylase. 4,519,934, Cl. 252-174.120.

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Lowe, David A.; Romancik, Guna; Cappelletti, Leonardo M.; and Elander, Richard P., 4,520,101, Cl. 435-49.000.

Elco Corporation: *See—*
Tillotson, John D., 4,519,664, Cl. 339-143.00R.

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Daniels, Ted M., 4,519,256, Cl. 73-745.000.

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Rabinowitz, Mario; and Perry, E. Robert, 4,520,078, Cl. 428-636.000.

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Elgas, Roger J.; and Gordon, Timothy M., to Cobe Laboratories, Inc. Fitting for corrugated tube. 4,519,393, Cl. 128-400.000.

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Cohen, Marlene L., 4,520,024, Cl. 514-255.000.

Elint Corporation: *See—*
Charlot, Lincoln H., 4,520,362, Cl. 343-361.000.

Elkem Metals Company: *See—*
Wells, James E., III, 4,519,838, Cl. 75-129.000.

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Atkinson, Robert W.; Elliott, Joseph W.; and Johnson, Donald W., 4,519,385, Cl. 128-66.000.

Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., to Kamyr, Inc. Surface condenser/water heating. 4,519,446, Cl. 165-101.000.

Elring Dichtungswerke GmbH: *See—*
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Emerson Electric Co.: *See—*
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Emhart Industries, Inc.: *See—*
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Emile, Philip, Jr.: *See—*
Kelly, Austin T.; Stolpen, Alan H.; and Emile, Philip, Jr., 4,520,310, Cl. 324-115.000.

Endo, Katsusuke; and Inagaki, Yoshio, to Fuji Photo Film Co., Ltd. Photographic elements for silver salt diffusion transfer process containing mercapto imidazole stabilizers. 4,520,096, Cl. 430-233.000.

Endou, Satosi: *See—*
Yokoe, Sadao; Abe, Seimei; Wakata, Shoichi; Endou, Satosi; and Onozawa, Kazuyoshi, 4,519,549, Cl. 239-703.000.

Engelhard Corporation: *See—*
Andrews, Robert W.; Himpsl, Francis L.; Horvath, Eugene B.; and Speronello, Barry K., 4,520,119, Cl. 502-67.000.
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Engineered Yarns, Inc.: *See—*
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Enns, Kurt: *See—*
Byerley, John J.; and Enns, Kurt, 4,519,880, Cl. 204-91.000.

Enomoto, Masaru; Kimura, Kenji; and Kawada, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Valve-actuating mechanism for three-valve internal-combustion engine. 4,519,364, Cl. 123-432.000.

Ensley, Burt D., Jr., to Amgen. Microbial production of indigo. 4,520,103, Cl. 435-121.000.

Enter, Rudolf; and Laverty, Michael P., to NCR Canada Ltd - NCR Canada Ltee. Self-adjusting sensor controller. 4,520,270, Cl. 250-560.000.

Entwistle, Ian D.; and Boehm, Peter, to Shell Oil Company. Anticoagulants of the 4-hydroxycoumarin type and rodenticidal compositions (baits) comprising such anti-coagulants. 4,520,007, Cl. 424-17.000.

Epson Corporation: *See—*
Koto, Haruhiko, 4,520,374, Cl. 346-140.00R.

Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., to American Home Products Corporation (Del.). Fetal heart rate monitor apparatus and method for combining electrically and mechanically derived cardiographic signals. 4,519,396, Cl. 128-698.000.

Ericsson, Thomas; Gylfe, Sten; and Hedblom, Mats-Olov, to Papyrus Kopparfors AB. Process for the absorption of organic liquids by use of a hydrophobic fibrous material. 4,519,918, Cl. 210-680.000.

Ernst Thielenhaus KG: *See—*
Thielenhaus, Ernst, 4,519,170, Cl. 51-289.00R.

Espitalie, Jean; Madec, Marcel; Leplat, Paul; and Paulet, Jacques, to Institut Francais du Petrole; and Societe Labofina S.A. Method and device for determining the organic carbon content of a sample. 4,519,983, Cl. 422-78.000.

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Luitz, Max; and Weiss, Eugen, 4,519,625, Cl. 280-633.000.

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Sandi, Floyd J.; and Vultaggio, Anthony, 4,520,241, Cl. 200-5.00B.

Etani, Kenji. Method for treating swimming pool water. 4,519,914, Cl. 210-633.000.

Ethicon, Inc.: *See—*
Cerwin, Robert J., 4,519,501, Cl. 206-339.000.

Ethyl Corporation: *See—*
Dinius, Richard L., 4,519,798, Cl. 604-358.000.

Eutectic Corporation: *See—*
Rotolico, Anthony J., 4,519,541, Cl. 239-1.000.

Evans, Herbert M. Method and apparatus for the non-destructive testing of materials. 4,519,245, Cl. 73-579.000.

Evans, Richard E., Jr.: *See—*
Kinney, William L., Jr.; and Evans, Richard E., Jr., 4,519,823, Cl. 55-493.000.

Evans, Thomas L., to General Electric Company. Method for preparation of aromatic ether imides and for catalyst recovery therein. 4,520,204, Cl. 548-461.000.

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Mitchell, William A.; Thompson, J. Brent; and Freese, John L., 4,519,734, Cl. 409-231.000.

Exxon Production Research Co.: *See—*
Tsao, Yuh-hwang; and Binder, George G., Jr., 4,519,452, Cl. 166-288.000.

Exxon Research & Engineering Co.: *See—*
Allan, David E., 4,519,898, Cl. 208-131.000.
Fiocco, Robert J., 4,519,901, Cl. 208-321.000.
Hochhauser, Albert M., 4,519,809, Cl. 44-53.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Duvdevani, Ilan; and Thaler, Warren A., 4,520,158, Cl. 524-481.000.
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F. C. Brown Rentals, Inc.: *See—*
Moody, Albert L., 4,519,428, Cl. 141-98.000.

Fachini, Robert M.; Orsborn, Jesse H.; and Barrett, Monroe C., to J. I. Case Company. Telescoping basket cover. 4,519,189, Cl. 56-16.600.

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Cronenberg, Dieter-Julius; and Faflek, Jeno , 4,519,165, Cl. 49-307.000.

Fal-Kon Investment Group: *See—*
Jirovetz, Andre, 4,519,533, Cl. 227-109.000.

Fanelli, Michael W.; and Masters, Edward R. Collapsible lantern. 4,520,431, Cl. 362-180.000.

Fanuc Ltd: *See—*
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,520,253, Cl. 217-69.00W.
Hattori, Seiichi; and Kanda, Kunio, 4,520,458, Cl. 364-900.000.

Farge, Daniel: *See—*
Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,520,193, Cl. 544-016.000.

Farmer, Norman L. Insecticide duster. 4,519,548, Cl. 239-652.000.

Farthing, George A., Jr.: *See—*
Lindstrom, Gerald D.; Eckhart, Clifford F.; Farthing, George A., Jr.; Muckley, James J.; and Taylor, Brian E., 4,519,322, Cl. 110-264.000.

Favrot, Guy: *See—*
Comment, Paul, 4,519,528, Cl. 222-396.000.

Fazio, Sebastian. Stabilizer strap. 4,519,159, Cl. 43-25.000.

Federowicz, Raymond J.: *See—*
Kinney, Roger D.; and Federowicz, Raymond J., 4,519,409, Cl. 135-88.000.

Feehan, John D.: *See—*
Belin, Rudolf E.; Boyce, William F.; and Feehan, John D., 4,519,195, Cl. 57-3.000.

Fehrenbach, Siegfried: *See—*
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Feirer, Egon; Amann, Ulrich; and Kuppinger, Gunter, to Maschinenfabrik Muller-Weingarten AG. Sliding tool table intended for the exchange of tools in presses. 4,519,309, Cl. 100-229.00R.

Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, to SMS Schloemann-Siemag AG. Roll stand with noncylindrical rolls. 4,519,233, Cl. 72-247.000.

Feldmuhle Aktiengesellschaft: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,519,359, Cl. 123-668.000.

Felicetta, Joseph A. Self contained indirect refrigeration system. 4,519,216, Cl. 62-185.000.

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Doyle, William D., 4,519,619, Cl. 277-235.00B.

Fennema, Alan A.: *See—*
Campbell, Jesse L.; Fennema, Alan A.; Henderson, Robert B.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,519,553, Cl. 242-56.00R.

Fenton, John W. Constant displacement turbine with vane which pivots and rotates. 4,519,756, Cl. 418-68.000.

Ferenc, Robert R.: *See—*
Bravenec, Thomas H.; Boyd, Roger L.; and Ferenc, Robert R., 4,519,974, Cl. 264-279.000.

Ferguson, Du'Bois J.: *See—*
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Ferranti plc: *See—*
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Fey, Rainer: *See—*
Dumbser, Gerhard; Lutz, Manfred; Fey, Rainer; and Weiss, Kurt, 4,519,227, Cl. 70-264.000.
Fichtel & Sachs AG: *See—*
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Fields, Gary C.; and Long, Gary E., to Remote Switch Systems, Inc. Remote cable switching system. 4,520,234, Cl. 179-2.00A.
Figuet, Jacques: *See—*
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Fine Particle Technology Corporation: *See—*
Wiech, Raymond E., Jr., 4,519,447, Cl. 165-104.330.
Wiech, Raymond E., Jr., 4,519,877, Cl. 204-15.000.
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Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, to Th. Goldschmidt AG. Material for deaerating coating systems. 4,520,173, Cl. 525-403.000.
Finn, Peter A.: *See—*
Prepodnik, Kay E.; Finn, Peter A.; and Manning, Daniel J., 4,519,219, Cl. 62-457.000.
Fiocco, Robert J., to Exxon Research & Engineering Co. Extractive separation process. 4,519,901, Cl. 208-321.000.
Fire Trumpet of America, Inc.: *See—*
Domingue, Willard A., 4,520,352, Cl. 340-590.000.
Firestone Tire & Rubber Company, The: *See—*
Hall, James E., 4,520,123, Cl. 502-153.000.
First National Bank, executor: *See—*
Schoeff, Terry G.; and Hemmert, Raymond A., deceased, 4,519,376, Cl. 126-121.000.
Firth, Rowland V. D., III; Goff, Willie, Jr.; Ku, Ta C.; and Rakes, James M., to International Business Machines Corporation. Multizone thermal print head. 4,520,371, Cl. 346-76.0PH.
Fisher, Charles B.: *See—*
Carpenter, Paul E.; Fisher, Charles B.; and Peash, Douglas E., 4,520,424, Cl. 361-383.000.
Fisher Controls, International, Inc.: *See—*
Brestel, Ronald R.; and Meyer, Dale L., 4,519,579, Cl. 251-172.000.
Fisher, John M., to B. F. Goodrich Company, The. Escape slide and life raft. 4,519,782, Cl. 441-40.000.
Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR: *See—*
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; and Postnikov, Viktor M., 4,519,230, Cl. 72-56.000.
Flachglas Aktiengesellschaft: *See—*
Spittka, Horst; Eckardt, Rudolf; and Neuendorf, Cristoph, 4,519,829, Cl. 65-114.000.
Fleischhacker, John J. Endocardial electrode lead with conical fixation mechanism. 4,519,404, Cl. 128-785.000.
Fletcher, Edwin; Beaton, Gerald V.; and Gomer, Charles R., to British Steel Corporation. Radiation level detectors. 4,520,266, Cl. 250-357.100.
Florian, Roy S., to Nickson Industries, Inc. Hinged flange for tailpipes and the like. 4,519,639, Cl. 285-415.000.
Florin, Guy, to Somfy. Alternate manual or power auxiliary control device for controlling winding doors or the like. 4,519,487, Cl. 192-36.000.
FMC Corporation: *See—*
Mick, Jon L., 4,519,468, Cl. 180-8.500.
Milberger, Lionel J., 4,519,263, Cl. 74-128.000.
Nichols, Randy P., 4,519,633, Cl. 285-3.000.
Focke & Co.: *See—*
Focke, Heinz, 4,519,492, Cl. 198-408.000.
Focke, Heinz, to Focke & Co. Method and apparatus for transporting packs from a feed track to a discharge-conveyor track. 4,519,492, Cl. 198-408.000.
Fog, Arne D.: *See—*
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Fogt, Eric J.: *See—*
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Folkers, Joie L., to Ameron Inc. Pipe coupling. 4,519,637, Cl. 285-113.000.
Ford Motor Company: *See—*
Crosbie, Gary M.; and Bretz, Gregory T., 4,519,967, Cl. 264-86.000.
Murphy, Richard D.; and Sokulsky, Marvin N., 4,519,626, Cl. 280-661.000.
Skynar, Larry, 4,519,589, Cl. 267-52.000.
Wells, Wayne E., 4,519,590, Cl. 267-52.000.
Wolak, Ronald G., 4,519,830, Cl. 65-162.000.
Yao, Yung-Fang Y., 4,520,005, Cl. 423-599.000.
Forney Engineering Company: *See—*
Paredes, Candelario; and Stevens, William D., 4,520,390, Cl. 358-108.000.
Forquer, William F., to Security Shutter Corporation. Winding mechanism for rollable shutter curtain. 4,519,434, Cl. 160-133.000.
Forsell, Kenneth A.; and Mallonen, Edward A., to Eaton Corporation. Constant load snap switch with manual or automatic reset, stop and test selection. 4,520,244, Cl. 200-67.0DA.
Forsheda AB: *See—*
Rautenberg, Karl, 4,519,567, Cl. 249-57.000.
Forward, Cleve H.: *See—*
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Foslien, Floyd L., to Minnesota Mining and Manufacturing Company. Stapler including ratchet means for preventing double feeding of staples. 4,519,532, Cl. 227-8.000.
Foster Wheeler Energy Corporation: *See—*
Toth, Dennis A., 4,519,324, Cl. 110-347.000.
Fouquet, Gerd: *See—*
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.
Fourre, Remy; and de Langre, Bruno, to Societe d'Etudes Et Conseils A E R O. Safety controller. 4,520,482, Cl. 371-68.000.
Fowler, L. B. Water well pumping system. 4,519,418, Cl. 137-571.000.
Fradella, Richard B. Brushless ultra-efficient regenerative servomechanism. 4,520,300, Cl. 318-603.000.
Francis, Ralph M., Jr.; and Isaacson, Jerome C. Photo flash lamp. 4,519,684, Cl. 354-145.100.
Franckowiak, Sigismond: *See—*
Deschamps, Andre ; and Franckowiak, Sigismond, 4,519,895, Cl. 208-8.0LE.
Frank, Louis M., to Raychem Corporation. Electrical monitoring systems. 4,520,417, Cl. 361-45.000.
Frankenberger, Horst: *See—*
Schwanbom, Erik; Frankenberger, Horst; and Baum, Marcel, 4,519,388, Cl. 128-204.250.
Frankiewicz, Jeffrey R.: *See—*
Heady, Robert E.; and Frankiewicz, Jeffrey R., 4,520,104, Cl. 435-160.000.
Frantz, Virgil L., to Roanoke College. Precoalescer unit. 4,519,819, Cl. 55-162.000.
Frazier, Donald; Daniels, J. Hartley; and Clapp, Daniel W., to Frazier, Donald. Cantilever rack construction. 4,519,512, Cl. 211-193.000.
Frazita, Richard F., to Hazeltine Corporation. Calibration of a system having plural signal-carrying channels. 4,520,361, Cl. 343-372.000.
Fredriksson, Hasse; and Tiberg, Lars, to Jernjontoret. Method of preventing formation of segregations during continuous casting. 4,519,439, Cl. 164-476.000.
Freeman, John W., to Seaboard Wellhead Control, Inc. Seal assembly and valve. 4,519,582, Cl. 251-328.000.
Freese, John L.: *See—*
Mitchell, William A.; Thompson, J. Brent; and Freese, John L., 4,519,734, Cl. 409-231.000.
Frentzel, Richard L., to Celotex Corporation, The. Polyoxyalkylene/unsaturated diester reaction product for cellular foam stabilization. 4,520,140, Cl. 521-115.000.
Frick Company: *See—*
Murphy, David A.; and Spellar, Peter C., 4,519,748, Cl. 417-45.000.
Frick, Roger L., to Rosemount Inc. Reactance measurement circuit with enhanced linearity. 4,519,253, Cl. 73-718.000.
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Kennedy, Richard B., 4,520,139, Cl. 521-109.100.
Fridman, Semyon D., to SCM Corporation. Two stage chlorination of titaniferous ore. 4,519,988, Cl. 423-76.000.
Fried. Krupp Gesellschaft m.b.H.: *See—*
Jester, Willi; and Kruger, Heinrich, 4,519,731, Cl. 407-46.000.
Fronduto, John: *See—*
Lee, Chung H.; Fronduto, John; and Oettinger, Peter E., 4,519,876, Cl. 204-15.000.
Fu, Chong-Cheng; and Gerzberg, Levy, to Leland Stanford Junior University, The Board of Trustees of the. Ultrasonic transducers and applications thereof. 4,519,260, Cl. 73-861.250.
Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, to VEB-Leuna-Werke "Walter Ulbricht". Method for improving the initial activity of activated hydrazine. 4,519,997, Cl. 423-265.000.
Fuhrmann, Wolf-Dieter: *See—*
Zylbert, Thaddeus J.; Fuhrmann, Wolf-Dieter; Hammer, Hans; and Kappertz, Fritz, 4,519,330, Cl. 112-222.000.
Fuji Photo Film Co., Ltd.: *See—*
Akimura, Yoshitaka; Mifune, Hiroyuki; and Nakamura, Koki, 4,520,099, Cl. 430-613.000.
Endo, Katsusuke; and Inagaki, Yoshio, 4,520,096, Cl. 430-233.000.
Iwakura, Ken; and Igarashi, Akira, 4,520,377, Cl. 346-208.000.
Kakimi, Fujio; and Mikami, Takeshi, 4,520,091, Cl. 430-110.000.
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,519,701, Cl. 355-39.000.
Kitamoto, Tatsuji; and Akashi, Goro, 4,520,069, Cl. 428-328.000.
Murakoshi, Makoto, 4,519,391, Cl. 128-303.150.
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Naruo, Kyoichi; and Okita, Tsutomu, 4,520,070, Cl. 428-336.000.
Fuji Xerox Co., Ltd.: *See—*
Moriguchi, Haruhiko; and Kurata, Masami, 4,520,381, Cl. 357-30.000.
Fuji Xerox Corporation, Limited: *See—*
Kimoto, Toshifumi; Itami, Teruhiko; Nishimura, Nobuo; and Saitoh, Koichi, 4,520,409, Cl. 360-59.000.
Fujidie Co., Ltd.: *See—*
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.

Fujii, Fumio: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Fujii, Hideichi; Yamane, Chiyoki; and Kawai, Fumio, to Kawasaki Jukogyo Kabushiki Kaisha; and Koshii & Co., Ltd. Composite plate. 4,520,057, Cl. 428-68.000.

Fujii, Yoshihiko; Tomita, Osamu; Taniguchi, Itaru; and Saiwai, Kazuhiko, to Kanzaki Paper Manufacturing Co., Ltd. Laser thermal printer. 4,520,370, Cl. 346-76.00L.

Fujimaki, Tatsuo: *See*—
Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,519,431, Cl. 152-209.00R.

Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, to Fujimoto Pharmaceutical Corp. Synthesis of cimetidine and analogs thereof. 4,520,201, Cl. 548-342.000.

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Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,520,201, Cl. 548-342.000.

Fujimura, Kazushiro; and Ito, Toshimitsu, to Toyota Jidosha Kabushiki Kaisha. Method of control of internal combustion engine variable swirl air-fuel intake system with direct and helical intake passages. 4,519,355, Cl. 123-491.000.

Fujioka, Futoshi; Boden, Richard M.; Schreiber, William L.; Whelan, Patrick; and Hanna, Marie R., to International Flavors & Fragrances Inc. 5-Alkoxybicyclo[2.2.1]heptane-2-oxypropane derivatives and uses thereof in augmenting or enhancing the aromas of perfume compositions, colognes and perfumed articles. 4,519,943, Cl. 252-522.00R.

Fujita, Sumio, to Seiko Instruments & Electronics, Ltd. Speech synthesizer. 4,520,502, Cl. 381-51.000.

Fujita, Teizo; and Tsuji, Yoshitaka, to Idec Izumi Corporation. Wire terminal connector. 4,519,668, Cl. 339-241.000.

Fujitsu Limited: *See*—
Yamada, Katuyuki; and Toyoda, Kazuhiro, 4,520,462, Cl. 365-189.000.

Fujiwara, Koji: *See*—
Takano, Osamu; and Fujiwara, Koji, 4,519,323, Cl. 110-281.000.

Fujiya, Toshimichi. Door opening-closing apparatus for large-sized refrigerator or the like. 4,519,641, Cl. 292-127.000.

Fukuchi, Hiroshi: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,519,273, Cl. 74-752.00A.

Fukuda, Tsutomu. Method for controlling a tufting machine. 4,519,332, Cl. 112-266.200.

Fukui, Toyoaki: *See*—
Danno, Yoshiaki; Kobayashi, Hiroyuki; and Fukui, Toyoaki, 4,520,272, Cl. 290-40.00A.

Fukumoto, Yasuhisa; and Moriyama, Noboru, to Kao Soap Co., Ltd. Maleic acid/(meth)acrylic acid copolymers useful as calcium ion capturing agents. 4,519,920, Cl. 210-701.000.

Fukunaga, Yasushi: *See*—
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.

Fukushima, Shigehisa: *See*—
Ono, Motoji; Hirao, Masao; and Fukushima, Shigehisa, 4,519,427, Cl. 141-65.000.

Fukutani, Masanori: *See*—
Oyobe, Kazuo; Nomura, Etsuji; Matsui, Kazuma; Fukutani, Masanori; Ito, Kazuyuki; Miwa, Naoto; and Ito, Keiji, 4,519,820, Cl. 55-284.000.

Fukuura, Shinichi: *See*—
Hikosaka, Shinichi; Murayama, Kosho; Fukuura, Shinichi; and Yanase, Takaomi, 4,519,906, Cl. 210-223.000.

Fulmer, Keith H., to Allied Corporation. Vacuum brake boosters. 4,519,295, Cl. 91-376.00R.

Furrow, Robert E., to Cooper Industries. Drawworks brake control. 4,519,585, Cl. 254-273.000.

Furukawa Electric Co., Ltd., The: *See*—
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.
Uesugi, Kenji; Irie, Shin-ichi; Asada, Yoshihisa; Maeda, Masahiro; Yamada, Nobuyuki; and Nakagawa, Hideaki, 4,520,230, Cl. 174-107.000.

Furukawa, Masahiko: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Furukawa, Shigeyoshi: *See*—
Yoshii, Toshio; and Furukawa, Shigeyoshi, 4,520,246, Cl. 200-144.00B.

G.D. Societa per Azioni: *See*—
Mattei, Riccardo, 4,519,406, Cl. 131-94.000.
Seragnoli, Enzo, 4,519,405, Cl. 131-94.000.

G. L. Rexroth GmbH: *See*—
Schulte, Heinz, 4,519,296, Cl. 91-388.000.

GAF Corporation: *See*—
Barabas, Eugene S.; and Cho, James R., 4,520,179, Cl. 526-212.000.
Barabas, Eugene S.; and Cho, James R., 4,520,180, Cl. 526-212.000.
Golder, Michael D., 4,520,148, Cl. 524-100.000.
Golder, Michael D., 4,520,149, Cl. 524-100.000.
Golder, Michael D., 4,520,150, Cl. 524-100.000.

Gagne, Pierre: *See*—
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,519,844, Cl. 106-209.000.

Galambos, Geza: *See*—
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.

Galiasso, Roberto E.: *See*—
Morales, Alfredo L.; Galiasso, Roberto E.; Agudelo, Maria M.; Salazar, Jose A.; and Carrasquel, Angel R., 4,520,128, Cl. 502-210.000.

Galindo, Eugene R. Catheter holder. 4,519,793, Cl. 604-180.000.

Gallagher, Terence J.; and LaCapria, Anthony, to American Bank Note Company. Identification card. 4,519,155, Cl. 40-625.000.

Gallaher Limited: *See*—
Sumner, Leslie, 4,519,298, Cl. 92-103.00F.

Gallo, Robert C.; Popovic, Mikulas; and Sarngadharan, Mangalasseril G., to United States of America, Health and Human Services. Serological detection of antibodies to HTLV-III in sera of patients with AIDS and pre-AIDS conditions. 4,520,113, Cl. 436-504.000.

Galtz, Rudiger, to Webasto-Werke W. Baier GmbH & Co. Hot-air heater. 4,519,375, Cl. 126-110.00B.

Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, to Fanuc Ltd. Wire-cut electric discharge machine control system to compensate for wire flexure during machining. 4,520,253, Cl. 217-69.00W.

Gane, Brian R.; and Howard, Philip, to British Petroleum Company p.l.c., The. Catalytic activity of aluminosilicate zeolites. 4,520,118, Cl. 502-53.000.

Garcia, Michel: *See*—
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,519,844, Cl. 106-209.000.

Gardner, Kathleen E. Typewriter keyboard layout. 4,519,721, Cl. 400-472.000.

Gargini, Paolo: *See*—
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,519,849, Cl. 148-1.500.

Garner, Lloyd L., to Rock Bit Industries U.S.A., Inc. Generally cylindrical rotary drill face seal having improved resistance to radial distortion. 4,519,614, Cl. 277-84.000.

Garrett Corporation, The: *See*—
Hardy, James A.; and Alfano, David L., 4,519,373, Cl. 123-559.000.

Gartner, Horst: *See*—
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,519,233, Cl. 72-247.000.

Gauck, Donald A. Louver tool. 4,519,235, Cl. 72-414.000.

Gaudiana, Russell A.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,520,189, Cl. 528-331.000.

Gauger, Gary L. Adjustable circumference floor tom stand. 4,519,289, Cl. 84-421.000.

Gauthier, Edouard A., to Nu-Bar Electronics. Sound transfer from a hearing aid to the human ear drum. 4,520,236, Cl. 179-107.00E.

Gauvin, William H.; and Kubanek, George R., to Hydro-Quebec. Transferred-arc plasma reactor for chemical and metallurgical applications. 4,519,835, Cl. 75-10.00R.

GCA Corporation: *See*—
Jones, Hugh D.; and Martinich, Steven J., 4,519,717, Cl. 374-17.000.

Geissler, Helmut: *See*—
Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geissler, Helmut, 4,519,224, Cl. 69-30.000.

General Dynamics Corporation, Electronics Division: *See*—
Hosking, Michael B., 4,520,429, Cl. 361-413.000.

General Dynamics, Pomona Division: *See*—
Kuffer, Fernand B., 4,519,707, Cl. 356-326.000.

General Electric Company: *See*—
Archibald, James B.; and Eats, James V., 4,519,669, Cl. 339-274.000.
Axelrod, Robert J., 4,520,152, Cl. 524-120.000.
Baldwin, Samuel L., 4,520,435, Cl. 362-311.000.
Castleberry, Donald E.; and Becker, Charles A., 4,520,357, Cl. 340-783.000.
Evans, Thomas L., 4,520,204, Cl. 548-461.000.
Kellie, Truman F., 4,520,388, Cl. 358-107.000.
Konrad, Charles E., 4,520,299, Cl. 318-587.000.
Kosmatka, Walter J., 4,520,433, Cl. 362-296.000.
Liu, Ping Y., 4,520,164, Cl. 525-67.000.
Mark, Victor; and Hedges, Charles V., 4,520,187, Cl. 528-176.000.
Merrill, Duane F., 4,519,720, Cl. 400-241.000.
Molari, Richard E., Jr., 4,519,154, Cl. 40-615.000.
O'Donnell, Timothy W.; and Olson, Daniel R., 4,520,074, Cl. 428-412.000.

General Instrument Corporation: *See*—
Clemens, Thomas G., 4,520,326, Cl. 331-116.00R.
Reichert, Harry J., Jr., 4,520,508, Cl. 455-4.000.
Wachspress, Melvin H.; and Abramowitz, Walter, 4,520,363, Cl. 343-828.000.

General Signal Corporation: *See*—
Lapinoja, Lonnie L., 4,519,583, Cl. 251-328.000.
Schwab, Carl E., 4,520,360, Cl. 340-947.000.

GenRad, Inc.: *See*—
Karash, Karl, 4,520,416, Cl. 361-11.000.

Genth, Hermann: *See—*
Schmitt, Hans-Georg; Palus, Wilfried; and Genth, Hermann, 4,520,023, Cl. 514-241.000.

Gentilman, Richard L.; Maguire, Edward A.; and Dolhert, Leonard E., to Raytheon Company. Transparent aluminum oxynitride and method of manufacture. 4,520,116, Cl. 501-98.000.

Gentzler, David: *See—*
Gillette, Dennis; and Gentzler, David, 4,519,507, Cl. 209-682.000.

Georg Muller Kugellagen Fabrik K.G.: *See—*
Petermann, Harald; and Loesch, Karl G., 4,519,166, Cl. 51-103.0WH.

George, Albert E.; and Poirier, Marc-Andre, to Canada, Her Majesty the Queen in right of, as represented by the Minister of Energy, Mines and Resources. Clarification of black water produced during recovery of bitumens and heavy oils. 4,519,915, Cl. 210-663.000.

George Angus & Company Limited: *See—*
Johnston, David E., 4,519,616, Cl. 277-152.000.

Gera, Abed: *See—*
Loebenstein, Gad; and Gera, Abed, 4,520,020, Cl. 424-197.100.

Gerber, Arthur H., to Martin Marietta Corporation. Admixture and method for improving hydraulic cement mixes. 4,519,842, Cl. 106-90.000.

Gerwin, Harry L. Control system for heliostats and method. 4,519,382, Cl. 126-425.000.

Gerzberg, Levy: *See—*
Fu, Chong-Cheng; and Gerzberg, Levy, 4,519,260, Cl. 73-861.250.

Ghinamo, Leonardo, to Bottero S.p.A. Device for automatic marking out and dividing up of a flat sheet of glass which can be positioned upstream of a sheet cutting line. 4,519,139, Cl. 33-32.00C.

Giangerelli, Frank. Black powder gun nipple. 4,519,157, Cl. 42-83.000.

Gibbons, Robert E., to Belco Pollution Control Corporation. Precipitator rapper. 4,519,817, Cl. 55-112.000.

Gibson, David K.: *See—*
Barker, Robert B.; Davidge, Ronald V.; Gibson, David K.; and Van Cleave, George W., 4,519,700, Cl. 355-3.0SH.

Gibson, Keith: *See—*
Eilertsen, Jens H.; Fog, Arne D.; and Gibson, Keith, 4,519,934, Cl. 252-174.120.

Giedt, Donald C.: *See—*
Inman, Frank S.; Giedt, Donald C.; and Lushis, Donald V., 4,519,290, Cl. 87-7.000.

Giesenberg, Peter: *See—*
Seeger, G. Hans J.; Giesenberg, Peter; and Steimel, Johannes, 4,519,291, Cl. 89-1.806.

Gilcrease, James P.: *See—*
Buls, Ronald L.; and Gilcrease, James P., 4,519,815, Cl. 55-46.000.

Gilead, Dan; and Scott, Gerald. Agricultural process using controllably degradable polymer composition film. 4,519,161, Cl. 47-9.000.

Gill, Dee R.; and Marks, Rex B., to Hercules Incorporated. Manufacture of filamentary composites. 4,519,869, Cl. 156-428.000.

Gillen, Orval D.; and Healey, John G., Jr., to Tanner Companies, The. Drum mixer and method. 4,519,711, Cl. 366-4.000.

Gillette, Dennis; and Gentzler, David, to Sensormatic Electronics Corporation. Apparatus for separating tacks from surveillance tags. 4,519,507, Cl. 209-682.000.

Gilliam, Edward C.: *See—*
Dingus, Jack D.; and Gilliam, Edward C., 4,519,489, Cl. 193-31.00R.

Gilly, Pierre E. Tennis racket stroke training device. 4,519,608, Cl. 273-29.00A.

Givaudan Corporation: *See—*
Dahill, Robert T.; Purzycki, Kenneth L.; and Golle, Erlinda F., 4,519,944, Cl. 252-522.00R.

Glanz, Kenneth D.; and Hoover, Troy E., to Appleton Papers Inc. Thermally-responsive record material. 4,520,379, Cl. 346-214.000.

Glaspie, Donald L.: *See—*
Kitterman, B. Layton; and Glaspie, Donald L., 4,519,960, Cl. 261-94.000.

Glattli, Hans-Heinrich: *See—*
Stoll, Kurt; and Glattli, Hans-Heinrich, 4,520,061, Cl. 428-137.000.

Glausch, Erhardt: *See—*
Horn, Roland; and Glausch, Erhardt, 4,519,185, Cl. 53-550.000.

Glazer, Alexander N.: *See—*
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., 4,520,110, Cl. 436-501.000.

Gleichauf, Winfried: *See—*
Gotz, Udo; Gleichauf, Winfried; Gunther, Oswin; and Hoffmann, Dietrich, 4,519,117, Cl. 29-1.200.

Glennon, Timothy F., to Sundstrand Corporation. Series transistor chopper. 4,520,279, Cl. 307-254.000.

Glenwood Manufacturing Corporation: *See—*
Johnson, Warren K.; Goettsch, Michael R.; and Olson, Archie H., 4,519,714, Cl. 366-285.000.

Gliemeroth, Georg: *See—*
Speit, Burkhard; Mennemann, Karl; and Gliemeroth, Georg, 4,520,115, Cl. 501-60.000.

Glitsch, Inc.: *See—*
Kitterman, B. Layton; and Glaspie, Donald L., 4,519,960, Cl. 261-94.000.

Godsey, H. Dean; Schoen, Donald F.; and Turek, Joseph F., to Quaker Oats Company, The. Apparatus and method for relining extruder barrels. 4,519,713, Cl. 366-79.000.

Goertler, Horst; and Rachner, Horst, to ITT Industries, Inc. Stop-start device for a motor vehicle engine. 4,520,271, Cl. 290-38.00C.

Goettsch, Michael R.: *See—*
Johnson, Warren K.; Goettsch, Michael R.; and Olson, Archie H., 4,519,714, Cl. 366-285.000.

Goff, Willie, Jr.: *See—*
Firth, Rowland V. D., III; Goff, Willie, Jr.; Ku, Ta C.; and Rakes, James M., 4,520,371, Cl. 346-76.0PH.

Golder, Michael D., to GAF Corporation. Thermoplastic elastomer compositions. 4,520,148, Cl. 524-100.000.

Golder, Michael D., to GAF Corporation. Elastomer compositions. 4,520,149, Cl. 524-100.000.

Golder, Michael D., to GAF Corporation. Stabilized elastomer compositions. 4,520,150, Cl. 524-100.000.

Golder, Peter: *See—*
Hofler, Willy; and Golder, Peter, 4,519,242, Cl. 73-162.000.
Meder, Willi; Bertz, Hans-Ulrich; and Golder, Peter, 4,519,141, Cl. 33-179.50R.

Golle, Erlinda F.: *See—*
Dahill, Robert T.; Purzycki, Kenneth L.; and Golle, Erlinda F., 4,519,944, Cl. 252-522.00R.

Golobic, Robert A.; and Scott, Michael H., to Joy Manufacturing Company. Propeller. 4,519,715, Cl. 366-343.000.

Gomer, Charles R.: *See—*
Fletcher, Edwin; Beaton, Gerald V.; and Gomer, Charles R., 4,520,266, Cl. 250-357.100.

Goodall, Brian L., to Shell Oil Company. Process of sequentially copolymerizing propylene-ethylene copolymers and catalyst therefor. 4,520,163, Cl. 525-53.000.

Goodyear Tire & Rubber Company, The: *See—*
Grimm, Donald C., 4,520,156, Cl. 524-397.000.

Gordon, Timothy M.: *See—*
Elgas, Roger J.; and Gordon, Timothy M., 4,519,393, Cl. 128-400.000.

Gorney, Moshe; and Dinur, Eldad, to Naan Mechanical Works. Drip irrigation apparatus. 4,519,546, Cl. 239-542.000.

Gossling Development Corporation: *See—*
Manzi, Joseph, 4,519,566, Cl. 248-360.000.

Gotz, Udo; Gleichauf, Winfried; Gunther, Oswin; and Hoffmann, Dietrich, to Mauser-Werke Oberndorf GmbH. Method of making projectile. 4,519,117, Cl. 29-1.200.

Gould, Grahame; Crossley, Anthony; and Moran, David P. J., to Lever Brothers Company. Edible emulsion having an improved microbiological stability. 4,520,037, Cl. 426-330.600.

Gould, Robert J.: *See—*
Snyder, Solomon H.; and Gould, Robert J., 4,520,112, Cl. 436-504.000.

Grabarski, David L.; and Williams, Harvey A. Power driven bottle opener. 4,519,276, Cl. 81-3.200.

Graf, Felix: *See—*
von Burg, Paul; Wirz, Armin; and Graf, Felix, 4,519,778, Cl. 432-35.000.

Grafen, Paul: *See—*
Schumacher, Horst; and Grafen, Paul, 4,519,961, Cl. 264-4.600.

Graniou, Louis. High temperature electric furnace with metallic resistances in the form of hollow vertical heating tubes. 4,520,487, Cl. 373-134.000.

Grasselli, Giorgio: *See—*
Alimbau Marques, Salvador; and Grasselli, Giorgio, 4,519,476, Cl. 182-28.000.

Grasselli, Robert K.: *See—*
Burrington, James D.; Pesa, Fred A.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,519,954, Cl. 260-465.80D.

Gray, Floyd R.; and Rood, Dennis D., to Otis Engineering Corporation. Well treating equipment and methods. 4,519,451, Cl. 166-278.000.

Grazioli, Angal J., to Cameron Iron Works, Inc. Valve and seal therefor. 4,519,412, Cl. 137-72.000.

Green, James B. P., Jr.: *See—*
Sherman, Earle C.; and Green, James B. P., Jr., 4,519,181, Cl. 53-374.000.

Green, Jerrold D.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.

Green, Jerry T.; and Beasley, Max M., to Tuftco Corporation. Segmental needle bar for multiple needle tufting machine. 4,519,326, Cl. 112-79.00R.

Green, Ralph R.; and Green, Robert C., to Imperial Clevite Inc. Wide pulse range periodic reverse unit. 4,520,281, Cl. 307-475.000.

Green, Robert C.: *See—*
Green, Ralph R.; and Green, Robert C., 4,520,281, Cl. 307-475.000.

Greenwood, Christopher J., to Leyland Vehicle Limited. Driveline for regenerative braking. 4,519,485, Cl. 192-0.033.

Gregg, Hans, to Carl Hurth Maschinen- und Zahnradfabrik GmbH & Co. Method and apparatus for automatically exchanging a workpiece in a machine tool. 4,519,733, Cl. 409-7.000.

Greschner, Johann: *See—*
Asch, Karl; Greschner, Johann; Kallmeyer, Michael; and Kulcke, Werner, 4,520,314, Cl. 324-158.00P.

Gresser, Robert; and Michel, Max, to Rhone-Poulenc Chimie de Base. Method of producing detergents with lower levels of incrustation of salts on fabrics by incorporating therein only type A zeolite detergent

builders having a certain determined rate constant. 4,519,933, Cl. 252-140.000.

GRETAG Aktiengesellschaft: *See—*
Mast, Fred; and Waser, Rudolf, 4,519,682, Cl. 353-122.000.

Griggs, Michael; Acton, Laurence L.; and Hall, Gordon D. Method and apparatus for accurate remote monitoring of gases. 4,520,265, Cl. 250-338.000.

Grima, Jean-Claude; Pando, Bernard; and David, Guy A. J., to U.S. Philips Corporation. Arrangement for re-arranging information for transmitting outgoing time-division multiplexed information obtained from incoming time-division multiplexed information. 4,520,479, Cl. 370-84.000.

Grimberg, Martine; and Berard, Alain, to Thomson-CSF. Digital data processing and storage system especially for a tomodensitometer, and a tomodensitometer equipped with said system. 4,520,442, Cl. 364-414.000.

Grimm, Donald C., to Goodyear Tire & Rubber Company, The. Scorch inhibitors for carboxylated rubbers. 4,520,156, Cl. 524-397.000.

Grinin, Jury A.: *See—*
Sychev, Anatoly P.; Sannikov, Jury I.; Grinin, Jury A.; Polyakov, Ivan P.; and Abdeev, Jury M., 4,519,836, Cl. 75-25.000.

Grogler, Gerhard: *See—*
Hess, Heinrich; Grogler, Gerhard; and Kopp, Richard, 4,520,186, Cl. 528-73.000.

Grohmann, Kurt, to Bayerische Motoren Werke A.G. System concomitantly controlling passenger compartment and electric auxiliary heating in automatic vehicles. 4,520,258, Cl. 219-279.000.

Grollimund, Everett C., to Philip Morris Incorporated. Beam chopper for producing multiple beams. 4,519,680, Cl. 350-486.000.

Gronle, Hansgeorg: *See—*
Sommer, Horst; and Gronle, Hansgeorg, 4,520,068, Cl. 428-324.000.

Grosse, Joachim; Hassler, Heinrich; and Tiefel, Gunter, to Siemens Aktiengesellschaft. Device for manufacturing laminated semifinished material. 4,519,234, Cl. 72-258.000.

Grosso, Roberto; and Hamilton, Tom P., to Vesuvius International Corporation. Opening for injecting a protective gas into a casting tube. 4,519,438, Cl. 164-415.000.

Grow, Carolyn P.: *See—*
Crean, Peter A.; D'Ortenzio, Remo J.; and Grow, Carolyn P., 4,520,455, Cl. 364-900.000.

Gruber, Robert J.: *See—*
Knapp, John F.; and Gruber, Robert J., 4,520,092, Cl. 430-120.000.

GTE Automatic Electric Inc.: *See—*
Simmons, Nathaniel; Puccini, Sergio E.; Magnusson, Stig E.; and Parikh, Kamal I., 4,520,478, Cl. 370-63.000.

GTE Products Corporation: *See—*
Shaffer, John W., 4,519,785, Cl. 445-48.000.

Gualtieri, Devlin M.; and Tumelty, Paul F., to Allied Corporation. Temperature stable magnetic bubble compositions. 4,520,460, Cl. 365-33.000.

Gubler, Hans-Rudolf, to BBC Brown, Boveri & Company, Limited. Drive and mounting for an open-end spinning unit. 4,519,205, Cl. 57-406.000.

Gude, Armin: *See—*
Michel, Klaus; and Gude, Armin, 4,519,968, Cl. 264-178.00R.

Gudkin, Timofei S.; Iordanishvili, Evgeny K.; Lidorenko, Nikolai S.; Malkovich, Bella E.; Razumovsky, Mikhail I.; and Rubashov, Igor B. Thermoelectric cryoprobe. 4,519,389, Cl. 128-303.100.

Gudmundson, Gunnar G.: *See—*
Kitch, Paul E.; Crochetiere, Raymond H.; Gudmundson, Gunnar G.; and Hadank, Walter R., 4,519,688, Cl. 354-297.000.

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Brachet, Alain; Figuet, Jacques; Guidez, Joel; and Lions, Noel, 4,519,978, Cl. 376-307.000.

Guigan, Jean, to Inovelf. Apparatus for bringing a liquid sample successively into contact with a number of reagents. 4,519,981, Cl. 422-64.000.

Guillaume, Michel: *See—*
Six, Jean-Claude G.; Claeys, Paul; and Guillaume, Michel, 4,519,771, Cl. 431-25.000.

Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, to Rieter Machine Works, Ltd. Method of threading a thread into a texturing nozzle. 4,519,115, Cl. 28-255.000.

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Mitchell, Bruce R.; and Vogel, Roger F., 4,520,120, Cl. 502-68.000.

Gullett, Edwin P.; Davis, Gerald B.; and Bustos, Rafael T., to Leggett & Platt, Incorporated. Shelf structure for a display rack. 4,519,508, Cl. 211-59.200.

Gunther, Oswin: *See—*
Gotz, Udo; Gleichauf, Winfried; Gunther, Oswin; and Hoffmann, Dietrich, 4,519,117, Cl. 29-1.200.

Gust, Jacob N., to Concord, Inc. Compaction and support apparatus. 4,519,460, Cl. 172-176.000.

Gustafson, Dale A.: *See—*
Weiss, Arnold A.; and Gustafson, Dale A., 4,520,307, Cl. 324-54.000.

Gutmark, Ephraim: *See—*
Ho, Chih-Ming; and Gutmark, Ephraim, 4,519,423, Cl. 137-888.000.

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Ericsson, Thomas; Gylfe, Sten; and Hedblom, Mats-Olov, 4,519,918, Cl. 210-680.000.

Haas, John C., to Chevron Research Company. Circulation loop for carrying out two-stage reactions. 4,519,810, Cl. 48-202.000.

Hadady Corporation: *See—*
Nelson, Thomas A., 4,519,480, Cl. 188-52.000.

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Kitch, Paul E.; Crochetiere, Raymond H.; Gudmundson, Gunnar G.; and Hadank, Walter R., 4,519,688, Cl. 354-297.000.

Hadaway, Robert J. Padlock. 4,519,226, Cl. 70-48.000.

Haeno, Akira: *See—*
Watanabe, Kazuo; Ohkubo, Yuichi; Haeno, Akira; and Yokogawa, Fumihiko, 4,520,282, Cl. 307-491.000.

Hagiwara, Zenzi; Yamamoto, Tatuo; and Kurozumi, Hiroshi, to Osaka Oxygen Industries Ltd. Process for extraction of highly purified oxygen. 4,519,813, Cl. 55-26.000.

Hagler, Brenda J.; and Repass, James T., to International Business Machines Corporation. Key-controlled method for invoking automatic row and column addition in an interactive text processing system. 4,520,457, Cl. 364-900.000.

Hagman, John F.; and Shih, Chi-Kai, to Du Pont de Nemours, E. I., and Company. Elastomeric sol/gel blends. 4,520,169, Cl. 525-185.000.

Hagyuda, Nobuyoshi; Hasegawa, Hiroshi; Iida, Yoshikazu; and Maida, Osamu, to Nippon Kogaku K.K. Electronic flash apparatus. 4,519,683, Cl. 354-127.110.

Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, to BASF Aktiengesellschaft. Particulate polystyrene containing blowing agent and having improved expandability. 4,520,135, Cl. 521-56.000.

Hahn, Larry A., to Texas Instruments Incorporated. High gain thyristor switching circuit. 4,520,277, Cl. 307-252.00C.

Hailey, Charles D. Apparatus for internally testing a plurality of interconnected pipe sections. 4,519,238, Cl. 73-40.50R.

Hakulinen, Martti J. A.: *See—*
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,519,359, Cl. 123-668.000.

Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schmitz, Alfred; and Mund, Heinz, to Saint-Gobain Vitrage. Process and apparatus for the automatic control of movement of an edge grinding machine. 4,519,167, Cl. 51-165.770.

Halcon SD Group, Inc., The: *See—*
Becker, Mitchell; and Sachs, Howard M., 4,519,875, Cl. 203-28.000.

Haldor Topsoe: *See—*
Skov, Allan; and Rostrup-Nielsen, Jens R., 4,520,216, Cl. 585-315.000.

Halford, Wayne R.; Renger, Larry H.; and Dooley, James J., to Mattel, Inc. Combined jump means and toy vehicle with simulated stunt hoop. 4,519,789, Cl. 446-444.000.

Hall, George R.: *See—*
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Hall, Gordon D.: *See—*
Griggs, Michael; Acton, Laurence L.; and Hall, Gordon D., 4,520,265, Cl. 250-338.000.

Hall, James E., to Firestone Tire & Rubber Company, The. Catalyst system and process for polymerizing conjugated dienes. 4,520,123, Cl. 502-153.000.

Hall, John B.; and Yoshida, Takao, to International Flavors & Fragrances Inc. Use in augmenting or enhancing the aroma or taste of foodstuffs or chewing gums of tetrahydro-1,1,2,3,3-pentamethyl-3A[4H]-indanol. 4,520,032, Cl. 426-3.000.

Hall, Laurance D.; and Sukumar, Subramaniam, to University of British Columbia, The. NMR imaging technique. 4,520,316, Cl. 324-309.000.

Hall, Lorna B. Medical appliance pouch with cover. 4,519,797, Cl. 604-332.000.

Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., to Norlin Industries, Inc. Method and apparatus for animated harmonization. 4,519,286, Cl. 84-1.030.

Hallauer, John J., to NCR Corporation. Transparent instruction word bus memory system. 4,520,464, Cl. 365-189.000.

Haller, Klaus: *See—*
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,519,120, Cl. 29-157.00R.

Halliburton Company: *See—*
Butler, William S., 4,519,617, Cl. 277-153.000.
Holtmyer, Marlin D.; Harris, Phillip C.; and Hunt, Charles V., 4,519,455, Cl. 166-305.00R.
Sutton, David L.; and Walker, Michael L., 4,519,922, Cl. 252-8.50B.

Ham, Norman D., to Massachusetts Institute of Technology. Helicopter individual blade control system. 4,519,743, Cl. 416-1.000.

Hamada, Eiichi; and Hamada, Kouzou, to Toyota Jidosha Kabushiki Kaisha. Locking device. 4,519,642, Cl. 292-247.000.

Hamada, Kouzou: *See—*
Hamada, Eiichi; and Hamada, Kouzou, 4,519,642, Cl. 292-247.000.

Hamane, Masumi: *See—*
Ochiai, Hideo; Hamane, Masumi; and Kimoto, Masahiko, 4,519,473, Cl. 180-229.000.

Hamano, Isao, to Mitsubishi Denki Kabushiki Kaisha. Starting motor with planetary gear reduction gears. 4,519,261, Cl. 74-7.00E.

Hamel, Roger G.; and Poulin, Susan B., to Morton Thiokol Inc. One-part activator and blowing agent for foaming plastics. 4,520,137, Cl. 521-79.000.

Hamilton, Billy H.: *See—*
Boettcher, Charles W., Jr.; Hamilton, Billy H.; Slak, William M.; and Zweig, Walter L., 4,520,437, Cl. 363-41.000.
Hamilton, Edward. Oil pan and windage tray for high performance engines. 4,519,348, Cl. 123-195.00C.
Hamilton, James G., to Barr & Stroud Limited. Optical waveguide slip ring assembly. 4,519,673, Cl. 350-96.320.
Hamilton, Tom P.: *See—*
Grosso, Roberto; and Hamilton, Tom P., 4,519,438, Cl. 164-415.000.
Hammer, Hans: *See—*
Zylbert, Thaddeus J.; Fuhrmann, Wolf-Dieter; Hammer, Hans; and Kappertz, Fritz, 4,519,330, Cl. 112-222.000.
Hand, James D. Transition pipe fitting. 4,519,634, Cl. 285-55.000.
Hann, Paul D.: *See—*
Casperson, John R.; and Hann, Paul D., 4,520,000, Cl. 423-456.000.
Hanna, Marie R.: *See—*
Fujioka, Futoshi; Boden, Richard M.; Schreiber, William L.; Whelan, Patrick; and Hanna, Marie R., 4,519,943, Cl. 252-522.00R.
Hansen, Clarence M.: *See—*
Ledebuhr, Richard L.; and Hansen, Clarence M., 4,519,191, Cl. 56-331.000.
Hansen, Ralph H., to Canusa Coating Systems Limited. Chemical compounds and use. 4,520,146, Cl. 524-94.000.
Hanson, David E., to Sargent-Welch Scientific Company. Gerotor vacuum pump. 4,519,755, Cl. 418-9.000.
Hara, Kazuyoshi: *See—*
Isozumi, Shuzoo; and Hara, Kazuyoshi, 4,520,285, Cl. 310-83.000.
Hara, Tomihiro; Adaniya, Takeshi; and Tonouchi, Akira, to Nippon Kokan Kabushiki Kaisha. Method of Fe-Zn alloy electroplating. 4,519,878, Cl. 204-28.000.
Hara, Toshizo: *See—*
Sutoh, Shinji; Hara, Toshizo; and Takahashi, Akiyoshi, 4,519,443, Cl. 165-17.000.
Harada, Hidemi: *See—*
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Haraguchi, Youichirou: *See—*
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichirou; Hayashi, Koji; and Kon, Shigeki, 4,519,862, Cl. 156-219.000.
Harden, Eldon A.; and Randol, Kent B., to J. I. Case Company. Two-way plow with offset trips. 4,519,461, Cl. 172-225.000.
Hardy, Donald P., Jr. Apparatus for filling a lined, semibulk container. 4,519,426, Cl. 141-5.000.
Hardy, James A.; and Alfano, David L., to Garrett Corporation, The. Internal combustion engine having a variably engagable slipping wet clutch for driving a supercharger. 4,519,373, Cl. 123-559.000.
Harel, Zahal: *See—*
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Harkness, Allan C.: *See—*
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Harris Corporation: *See—*
Chan, Luen C.; Beckwith, Paul B.; and Pearce, Jeffrey B., 4,520,506, Cl. 382-56.000.
Dufour, Charles H.; and Newman, Jonathan G., 4,520,454, Cl. 364-900.000.
Hershberger, David L., 4,520,498, Cl. 381-16.000.
Harris, Elbert E.; and Thorsett, Eugene D., to Merck & Co., Inc. Substituted caprolactam derivatives as antihypertensives. 4,520,021, Cl. 514-212.000.
Harris, James E.; and Robeson, Lloyd M., to Union Carbide Corporation. Composition useful for making circuit board substrates and electrical connectors. 4,520,067, Cl. 428-323.000.
Harris, Phillip C.: *See—*
Holtmyer, Marlin D.; Harris, Phillip C.; and Hunt, Charles V., 4,519,455, Cl. 166-305.00R.
Harris, Warren R. Handle for extending the reach of a rope. 4,519,643, Cl. 294-19.100.
Harrison, George W., to Team, Inc. Method of waterproofing a porous wall. 4,520,051, Cl. 427-387.000.
Hartemink, Gerrit A., to Advanced Semiconductor Materials International, N.V. Improved flow meter. 4,519,246, Cl. 73-204.000.
Hartmann, Heinrich: *See—*
Schneider, Kurt; Heide, Wilfried; Hartmann, Juergen; and Hartmann, Heinrich, 4,520,210, Cl. 560-222.000.
Hartmann, Juergen: *See—*
Schneider, Kurt; Heide, Wilfried; Hartmann, Juergen; and Hartmann, Heinrich, 4,520,210, Cl. 560-222.000.
Hascal, Marcel; Watson, Donald A.; Danielski, Andrew; and Lopez, Sergio. Electric field strength indicator. 4,520,318, Cl. 324-457.000.
Hasegawa, Hiroshi: *See—*
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Hasegawa, Yutaka: *See—*
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Hashiguchi, Don H.; Klar, Erhard; and Dietrich, Ronald J., to SCM Corporation. Halosilane catalyst and process for making same. 4,520,130, Cl. 502-345.000.
Hashimoto, Takafumi, to Meidensha Electric Mfg. Co., Ltd. Electrolytes circulation type cell stack secondary battery. 4,520,080, Cl. 429-18.000.
Haskin, Helen K.: *See—*
Davis, Lorne A., Jr.; and Haskin, Helen K., 4,519,982, Cl. 422-68.000.
Hassler, Heinrich: *See—*
Grosse, Joachim; Hassler, Heinrich; and Tiefel, Gunter, 4,519,234, Cl. 72-258.000.
Hastings, Jerome K.; Brubaker, John R.; and Kroll, John W., to Eaton Corporation. Electrothermally actuated switch. 4,520,336, Cl. 337-140.000.
Hatano, Hirofumi; and Hirota, Yoji, to Mitsubishi Mining and Cement Co.; and Mitsubishi Jukogyo Kabushiki Kaisha. Cyclone. 4,519,822, Cl. 55-459.00R.
Hatayama, Keiji: *See—*
Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, 4,519,274, Cl. 74-866.000.
Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, 4,519,275, Cl. 74-866.000.
Hattori, Makoto; Taguma, Akihiro; Morimitsu, Toshihiko; and Takeshita, Akira, to Sumitomo Chemical Co., Ltd. Process for producing anthraquinone compounds. 4,519,947, Cl. 260-371.000.
Hattori, Seiichi; and Kanda, Kunio, to Fanuc Ltd. Apparatus for controlling writing of data into a memory having different read and write times. 4,520,458, Cl. 364-900.000.
Hausner, Gerd; and Semmelrodt, Rolf, to Zinser Textilmaschinen GmbH. Spinning or twisting machine, especially for glass-fiber threads. 4,519,202, Cl. 57-264.000.
Hawkeye Chemical Company: *See—*
Moore, William P., 4,519,831, Cl. 71-13.000.
Hawkeye Food Machinery, Inc.: *See—*
Vanosdall, Dennis L., 4,519,305, Cl. 99-625.000.
Hawkins, Ronald G.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.
Hawley, Gil R.: *See—*
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Hayasaka, Toyoo: *See—*
Kamata, Nobuo; Sekiya, Takashi; Takeda, Kazutoshi; Hayasaka, Toyoo; and Yoshida, Tomohisa, 4,520,087, Cl. 429-219.000.
Hayashi, Koji: *See—*
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichirou; Hayashi, Koji; and Kon, Shigeki, 4,519,862, Cl. 156-219.000.
Hayashi, Kunihisa; and Nogami, Takahiro, to Toyota Jidosha Kabushiki Kaisha. Method and apparatus for automatic control of driving speed. 4,519,469, Cl. 180-169.000.
Hayashi, Masaharu; Tsuchikawa, Syunzo; and Itakura, Masato, to Aisin Seiki Kabushiki Kaisha. Engine cooling system. 4,519,343, Cl. 123-41.490.
Hayashi, Masahiro; Nozawa, Seiichi; and Oikawa, Takashi, to Mitsubishi Chemical Industries Ltd. Aromatic polyester containing phenolphthalein unit and bis-phenol unit. 4,520,208, Cl. 549-308.000.
Hayashi, Nobuaki: *See—*
Morishita, Hajime; Akagi, Motoo; Hayashi, Nobuaki; Nonogaki, Saburo; Uchino, Shoichi; and Kohashi, Takahiro, 4,520,094, Cl. 430-144.000.
Hazeltine Corporation: *See—*
Frazita, Richard F., 4,520,361, Cl. 343-372.000.
Heady, Robert E.; and Frankiewicz, Jeffrey R., to CPC International Inc. Production of butanol by a continuous fermentation process. 4,520,104, Cl. 435-160.000.
Healey, John G., Jr.: *See—*
Gillen, Orval D.; and Healey, John G., Jr., 4,519,711, Cl. 366-4.000.
Healy, George M.; and Curry, Kenneth D., to Polydex Chemicals Ltd. Tissue culture and cell growth-promoting material and its method of manufacture. 4,520,107, Cl. 435-240.000.
Heard, Charles M.; and Yang, Frank C., to Hughes Aircraft Company. Adaptive recursive frequency offset tracking system. 4,520,493, Cl. 375-97.000.
Heat Power Products Corporation: *See—*
Sebald, Joseph F., deceased, 4,519,444, Cl. 165-47.000.
Hedblom, Mats-Olov: *See—*
Ericsson, Thomas; Gylfe, Sten; and Hedblom, Mats-Olov, 4,519,918, Cl. 210-680.000.
Hedges, Charles V.: *See—*
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Hedrich, Dieter: *See—*
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Heide, Wilfried: *See—*
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Heinrich, Hans; and Hedrich, Dieter, to Daimler-Benz Aktiengesellschaft. Process for hydrogen-impermeable brazing of austenitic structural steel parts. 4,519,537, Cl. 228-221.000.
Heiss, Lorenz, to Hoechst Aktiengesellschaft. Process for preparing stilbenedicarbonitriles. 4,519,953, Cl. 260-465.00H.
Held, Kurt. Automatic drafting device with adjusting aid. 4,519,138, Cl. 33-32.00R.
Heldt, Carl R. Brace extension for locking pliers. 4,519,278, Cl. 81-427.500.
Hellier, John A. Method and apparatus for treating tobacco. 4,519,407, Cl. 131-291.000.
Helling, James: *See—*
McNair, Rhett; and Helling, James, 4,520,436, Cl. 362-366.000.

Helmick, Timothy A. Continuous filtering system for cooking oil. 4,519,904, Cl. 210-167.000.

Hemens, James F., to Teleflex Morse Limited. Power assistance control device. 4,519,294, Cl. 91-374.000.

Hemmert, Raymond A., deceased: *See—*
Schoeff, Terry G.; and Hemmert, Raymond A., deceased, 4,519,376, Cl. 126-121.000.

Henderson, Robert B.: *See—*
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Heneka, Rolf: *See—*
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Henkel Kommanditgesellschaft auf Aktien: *See—*
Lepper, Herbert; and Schutt, Hartwig, 4,520,211, Cl. 568-863.000.
Preuss, Wolfgang, 4,519,949, Cl. 260-397.100.

Herbert Kannegisser GmbH & Co.: *See—*
Kannegiesser, Martin; Mussiger, Klaus; and Dreischmeier, Wilfried, 4,519,222, Cl. 68-5.00C.

Herbert, William J.: *See—*
Kotian, Vijayraj M.; Blumer, Roger L.; and Herbert, William J., 4,520,260, Cl. 219-553.000.

Hercules Incorporated: *See—*
Diveley William R.; and Clayton, Anthony B., 4,520,171, Cl. 525-279.000.
Gill, Dee R.; and Marks, Rex B., 4,519,869, Cl. 156-428.000.
Klosiewicz, Daniel W., 4,520,181, Cl. 525-247.000.
Maslanka, William W., 4,520,159, Cl. 524-606.000.

Hering, Bernhard: *See—*
Steiger, Erwin; and Hering, Bernhard, 4,520,254, Cl. 219-121.00L.

Herion, Dieter: *See—*
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,519,115, Cl. 28-255.000.

Hermanson, William O., to Tecumseh Products Company. Engine flywheel brake toggle mechanism. 4,519,486, Cl. 192-3.00S.

Herrington, F. John, to Mobil Oil Corporation. Air ring plenum with molded housing. 4,519,146, Cl. 34-104.000.

Hershberger, David L., to Harris Corporation. AM Stereo modulator. 4,520,498, Cl. 381-16.000.

Herweyer, Elliott E.: *See—*
Whyte, Lance; and Herweyer, Elliott E., 4,519,919, Cl. 210-695.000.

Hess, Heinrich; Grogler, Gerhard; and Kopp, Richard, to Bayer Aktiengesellschaft. Polyurethanes and polyurethane-ureas based on aromatic uret dione diamine adducts. 4,520,186, Cl. 528-73.000.

Hesse, Wolfgang: *See—*
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,519,120, Cl. 29-157.00R.

Heuchert, Johann K.: *See—*
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Heuer, Charles: *See—*
Cox, Charles M.; and Heuer, Charles, 4,520,392, Cl. 358-147.000.

HGM, Inc.: *See—*
Horne, Kenneth J., 4,519,390, Cl. 128-303.100.

Hibi, Hitoshi, to Sharp Kabushiki Kaisha. Auto brightness limiter circuit for television. 4,520,397, Cl. 358-168.000.

Hidaka Seiki KK: *See—*
Yokosawa, Tomoo, 4,519,121, Cl. 29-157.30C.

Higashio Pipe Fittings Mfg. Co., Ltd.: *See—*
Yodoshi, Tatsuo; Ohata, Hiroyoshi; and Inoue, Hiroshi, 4,519,638, Cl. 285-305.000.

Higgins, William A., to Lubrizol Corporation, The. Dye-receptive polyolefins and polyolefin fibers. 4,520,155, Cl. 524-166.000.

Hijikigawa, Masaya: *See—*
Miyoshi, Shuji; Sugihara, Takashi; Jinda, Akihito; and Hijikigawa, Masaya, 4,520,341, Cl. 338-35.000.

Hikosaka, Shinichi; Murayama, Kosho; Fukuura, Shinichi; and Yanase, Takaomi, to Dai Nippon Insatsu Kabushiki Kaisha. Apparatus for the separation of magnetic and nonmagnetic solid particles from a liquid. 4,519,906, Cl. 210-223.000.

Hilaire, Jacob: *See—*
Schreiber, Adam; and Hilaire, Jacob, 4,519,101, Cl. 3-1.912.

Hill, Charles A. Vessel lid attachment. 4,519,520, Cl. 220-263.000.

Hill, Roland J.; and Acarnley, Paul P., to National Research Development Corporation. Stepping motors and drive circuits therefor. 4,520,302, Cl. 318-696.000.

Hillemanns, Herbert; Samans, Robert; and Meyer, Walter, to Mannesmann Aktiengesellschaft. Method and apparatus for the recovery of spraying substance when spraying elongated rolled stock. 4,520,047, Cl. 427-331.000.

Hillman, Gary, to Machine Technology, Inc. Method and apparatus for dispensing liquid. 4,519,526, Cl. 222-212.000.

Himes, Glenn R., to Shell Oil Company. Dull, smooth unit soles. 4,520,138, Cl. 521-91.000.

Himpsl, Francis L.: *See—*
Andrews, Robert W.; Himpsl, Francis L.; Horvath, Eugene B.; and Speronello, Barry K., 4,520,119, Cl. 502-67.000.

Hipple, Robert J. Transforming the upright vacuum cleaner's own push-pull handle into a suction cleaning wand. 4,519,113, Cl. 15-335.000.

Hiramatsu, Takeo: *See—*
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,519,273, Cl. 74-752.00A.

Hirano, Hideo, to Okamoto & Co., Ltd. Knitting machine. 4,519,221, Cl. 66-107.000.

Hirano, Hiroyuki: *See—*
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,519,790, Cl. 474-18.000.

Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, to Director-General of the Agency of Industrial Science & Technology. Polymeric compounds with sustained anti-tumor activity and a method for the preparation thereof. 4,520,162, Cl. 525-327.600.

Hirao, Masao: *See—*
Ono, Motoji; Hirao, Masao; and Fukushima, Shigehisa, 4,519,427, Cl. 141-65.000.

Hiraoka, Ryosei: *See—*
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.

Hirose, Yoshiyuki. Parts feeder. 4,519,524, Cl. 221-167.000.

Hirota, Junichi: *See—*
Koh, Hiroshi; and Hirota, Junichi, 4,520,343, Cl. 340-19.00R.

Hirota, Yoji: *See—*
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Hisajima, Masahiko: *See—*
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Satonaka, Shinobu; Kaminaga, Seiji; and Ishito, Mitsuya, 4,519,702, Cl. 355-51.000.

Hitachi Cable, Ltd.: *See—*
Sasaki, Hajime; and Nishiyama, Shinichi, 4,519,980, Cl. 420-474.000.

Hitachi Chemical Company, Ltd.: *See—*
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,519,690, Cl. 354-324.000.

Hitachi Engineering Co., Ltd.: *See—*
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.

Hitachi Heating Appliances Co., Ltd.: *See—*
Ishihara, Masahiro; Watanabe, Mitsuru; Ohkawa, Shuji; Taguchi, Shunichi; and Kikuchi, Itsuo, 4,520,250, Cl. 219-10.55B.

Hitachi, Ltd.: *See—*
Arita, Setsuo; and Ito, Tetsuo, 4,520,483, Cl. 371-68.000.
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Morishita, Hajime; Akagi, Motoo; Hayashi, Nobuaki; Nonogaki, Saburo; Uchino, Shoichi; and Kohashi, Takahiro, 4,520,094, Cl. 430-144.000.
Okabe, Akira; Urushidani, Haruo; and Kashiwahara, Katsuto, 4,519,207, Cl. 60-39.182.
Sakitani, Yoshio; and Minamikawa, Yoshihisa, 4,520,421, Cl. 361-234.000.
Shimura, Tastuo, 4,520,382, Cl. 357-53.000.
Sugahara, Kenshi; Yasuda, Kazuo; and Mori, Junji, 4,519,891, Cl. 204-418.000.
Watanabe, Kazuo; Ohkubo, Yuichi; Haeno, Akira; and Yokogawa, Fumihiko, 4,520,282, Cl. 307-491.000.
Yoshida, Kasumi; Uchiki, Hideo; and Kuroishi, Tadafumi, 4,520,108, Cl. 436-52.000.

Hitchcock, James R., Jr.; and Nevens, Charles J., to Baxter Travenol Laboratories, Inc. Disposable swab. 4,519,795, Cl. 604-289.000.

Hitzman, Donald O. Apparatus for carrying out sparged reaction. 4,519,984, Cl. 422-196.000.

HK-Engineering Aktiebolag: *See—*
Kitsnik, Henrik M., 4,519,753, Cl. 417-403.000.

Ho, Chih-Ming; and Gutmark, Ephraim, to University of Southern California. Mixing apparatus using a noncircular jet of small aspect ratio. 4,519,423, Cl. 137-888.000.

Hochhauser, Albert M., to Exxon Research & Engineering Co. Method for reducing water sensitivity of ether containing gasoline compositions. 4,519,809, Cl. 44-53.000.

Hocker, Jurgen; Muller, Hans K.; and Broich, Bruno, to Bayer Aktiengesellschaft. Particulate doped polyacetylene. 4,519,939, Cl. 252-500.000.

Hodgson, Donald E. Combination tool. 4,519,108, Cl. 7-167.000.

Hoechst Aktiengesellschaft: *See—*
Heiss, Lorenz, 4,519,953, Cl. 260-465.00H.

Hofer, Gerald: *See—*
Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Straubel, Max, 4,519,352, Cl. 123-373.000.

Hoffman, Gilbert A., to Tektronix, Inc. Phase shifters. 4,520,325, Cl. 330-302.000.

Hoffman, James E. Gas injection valve. 4,519,372, Cl. 123-470.000.

Hoffmann, Dietrich: *See—*
Gotz, Udo; Gleichauf, Winfried; Gunther, Oswin; and Hoffmann, Dietrich, 4,519,117, Cl. 29-1.200.

Hoffmann, Horst, to Wilhelm Ruf KG. Multi-layer conductor plate and a method of making. 4,520,228, Cl. 174-68.500.

Hoffmann-La Roche Inc.: *See—*
Reiner, Roland, 4,520,195, Cl. 544-182.000.

Hoffmann, Wolfgang. Computer controlled labelling machine. 4,519,868, Cl. 156-353.000.

Hoffmeister, Hermann: *See—*
Wagenseil, Ludwig; and Hoffmeister, Hermann, 4,519,413, Cl. 137-111.000.

Hofler, Willy. Automatic gear testing apparatus. 4,519,241, Cl. 73-162.000.

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Hofler, Willy: *See—*
Meder, Willi; Bertz, Hans-Ulrich; and Golder, Peter, 4,519,141, Cl. 33-179.50R.

Hogge, Charles R., Jr., to Rockwell International Corporation. Decision feedback equalizing apparatus. 4,520,489, Cl. 375-14.000.

Hohn, Wolfgang: *See—*
Schwarze, Werner; Kleemann, Axel; Remmel, Hans; and Hohn, Wolfgang, 4,520,209, Cl. 560-124.000.

Hohne, Karl; and Starbeck, Gerd, to Siemens Aktiengesellschaft. Hydrogen/bromine cell. 4,520,081, Cl. 429-19.000.

Holland, Ronald A.; Petrie, Harold L.; Brennan, John R.; and Christ, Frederick C., to Armco Inc. Oil well standing valve. 4,519,457, Cl. 166-317.000.

Holler, Mark A.: *See—*
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,519,849, Cl. 148-1.500.

Hollmann, Friedrich: *See—*
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,519,233, Cl. 72-247.000.

Hollyday, Robert D.: *See—*
Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger; Hollyday, Robert D.; and Kling, John P., 4,519,665, Cl. 339-147.00R.

Holmes, Gordon W., to Professional Packaging Limited. Book cover. 4,519,630, Cl. 281-31.000.

Holtmyer, Marlin D.; Harris, Phillip C.; and Hunt, Charles V., to Halliburton Company. Fracturing method for stimulation of wells utilizing carbon dioxide based fluids. 4,519,455, Cl. 166-305.00R.

Holzrichter, Edward J.; and Smith, Marc L., to Whittaker Corporation. Polyester-forming composition for coil coatings, improved polyester resin and method of making same. 4,520,188, Cl. 528-274.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Ebisawa, Masuo; Kawase, Akio; and Nakamura, Akiyoshi, 4,519,436, Cl. 164-120.000.
Enomoto, Masaru; Kimura, Kenji; and Kawada, Keiichi, 4,519,364, Cl. 123-432.000.
Ishihara, Tuneo; and Uchida, Masayosi, 4,519,762, Cl. 425-183.000.
Kamiya, Tadashi; Kawasaki, Kazuhiro; and Muranaka, Akio, 4,519,099, Cl. 2-424.000.
Kamiya, Tadashi, 4,519,472, Cl. 180-227.000.
Miyakoshi, Shinichi; and Oyama, Kazuo, 4,519,471, Cl. 180-219.000.
Nagase, Hidenobu; Suzuki, Shigeru; and Shimada, Shinichi, 4,519,371, Cl. 123-470.000.
Nakanishi, Yasuo; Sakamoto, Kazunori; Ando, Giichi; and Watanabe, Teruoki, 4,519,854, Cl. 148-127.000.
Ochiai, Hideo; Hamane, Masumi; and Kimoto, Masahiko, 4,519,473, Cl. 180-229.000.
Ohyama, Kazuo; and Kitami, Takashi, 4,519,344, Cl. 123-55.0VF.

Honda, Keijiro: *See—*
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,519,690, Cl. 354-324.000.

Honda, Toshikazu: *See—*
Tsuno, Katsushige; and Honda, Toshikazu, 4,520,264, Cl. 250-311.000.

Honeywell, Inc.: *See—*
Houvig, Felix J.; and Rowlands, Ronald H., 4,520,488, Cl. 375-5.000.

Honeywell Information Systems Inc.: *See—*
O'Keefe, David B.; and Miller, Robert C., 4,520,356, Cl. 340-750.000.

Hongo, Chikara: *See—*
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,519,955, Cl. 260-501.120.

Honya, Takao: *See—*
Ishido, Takao; Nakao, Masasi; Honya, Takao; and Mizuno, Yukio, 4,519,424, Cl. 139-91.000.

Hoobler, Mary A.: *See—*
Sikorski, James A.; and Hoobler, Mary A., 4,519,832, Cl. 71-87.000.

Hoover, Troy E.: *See—*
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Hopkinson, Erle: *See—*
Clare, Kenneth; and Hopkinson, Erle, 4,519,803, Cl. 8-445.000.

Horansky, Frank J.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.

Hori, Kiyoharu, to Rion Kabushiki Kaisha. Method for measuring the degree of nasality. 4,519,399, Cl. 128-724.000.

Hori, Yuji; Nishimura, Yoshichika; and Takahashi, Fuminobu, to Daiichi Kogyo Seiyaku Co., Ltd. Fluid composition for drilling. 4,519,923, Cl. 252-8.50C.

Horiba, Ltd.: *See—*
Uematsu, Hiroaki; Aoki, Junji; and Oku, Narihiro, 4,519,890, Cl. 204-409.000.

Horike, Masanori: *See—*
Ishikawa, Chuji; Iwasaki, Kyuhachiro; Horike, Masanori; and Komai, Hiromichi, 4,520,367, Cl. 346-75.000.

Horikiri, Kenji; Ueda, Fumio; and Ideno, Hiroaki, to Mitsubishi Denki Kabushiki Kaisha. Liquid crystal display device. 4,519,679, Cl. 350-339.00R.

Horimatsu, Kazuo, to Tekken Construction Co., Ltd. Method for constructing underground structure. 4,519,730, Cl. 405-258.000.

Horino, Shigeo: *See—*
Ohba, Hiroshi; and Horino, Shigeo, 4,519,523, Cl. 221-129.000.

Horn, Roland; and Glausch, Erhardt, to Beck & Co., Packautomaten. Device for deflection of a continuous film web in a packaging machine. 4,519,185, Cl. 53-550.000.

Horne, Kenneth J., to HGM, Inc. Fiber optic laser catheter. 4,519,390, Cl. 128-303.100.

Hornschuh, Manfred, to Windmoller & Holscher. Method of mounting printing blocks in correct positions on form cylinders of flexographic printing machines for multicolor printing. 4,520,389, Cl. 358-107.000.

Horttonen, Kalevi, to O. Kytola ja Kumpp. Kommandiittiyhtio . Procedure for lubricating the bearings in equipment comprising a plurality of oil-lubricated bearings. 4,519,247, Cl. 73-198.000.

Horvath, Eugene B.: *See—*
Andrews, Robert W.; Himpsl, Francis L.; Horvath, Eugene B.; and Speronello, Barry K., 4,520,119, Cl. 502-67.000.

Hoshi, Hideaki; Okumura, Jun; Naito, Takayuki; Abe, Yoshio; and Aburaki, Shimpei, to Bristol-Myers Company. Substituted vinyl cephalosporins. 4,520,022, Cl. 514-200.000.

Hosking, Michael B., to General Dynamics Corporation, Electronics Division. Dual-path circuit board connector with internal switching. 4,520,429, Cl. 361-413.000.

Hoskins, John T.; and Zillig, Robert G. Fluid coupling and method of assembly. 4,519,449, Cl. 165-141.000.

Hosoya, Nobukazu: *See—*
Murakami, Yoshihiro; and Hosoya, Nobukazu, 4,520,328, Cl. 332-31.00T.

Houvig, Felix J.; and Rowlands, Ronald H., to Honeywell, Inc. Communication system and method. 4,520,488, Cl. 375-5.000.

Hovan, Francis E.: *See—*
Canning, Terry D.; and Hovan, Francis E., 4,519,667, Cl. 339-186.00M.

Howard, Philip: *See—*
Gane, Brian R.; and Howard, Philip, 4,520,118, Cl. 502-53.000.

Howard, Roland M., Jr.: *See—*
Jones, Marvin R.; and Howard, Roland M., Jr., 4,519,571, Cl. 251-1.00A.

Howes, Ronald B., Jr.: *See—*
Warwick, Dennis J.; Nubson, Richard C.; and Howes, Ronald B., Jr., 4,519,600, Cl. 271-4.000.

Howlett, Robert J., to Container Corporation of America. Tubular paperboard display stand. 4,519,319, Cl. 108-111.000.

Hoxan Corporation: *See—*
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, 4,519,764, Cl. 425-256.000.

Hrushesky, William J. M. Medical instrument for noninvasive measurement of cardiovascular characteristics. 4,519,395, Cl. 128-671.000.

Hsia Chen, Catherine S., to Mobil Oil Corporation. Process of making high VI lubes. 4,520,221, Cl. 585-517.000.

Hsu, Chao-Yang; and Lyons, James E., to Sun Tech, Inc. Process for oxidizing a phenol to a p-benzoquinone. 4,519,948, Cl. 260-396.00R.

Hsu, Sheng T., to RCA Corporation. Method of fabricating high speed CMOS devices. 4,519,126, Cl. 29-571.000.

Huang, Henry C. Mail box with remote indicator. 4,520,350, Cl. 340-569.000.

Hubbell, Leslie A. Safety cap for fence posts. 4,520,231, Cl. 174-158.00F.

Hudson, Sharon J., Jr., to Sharon Manufacturing Company. Fuel injection rail assembly. 4,519,368, Cl. 123-468.000.

Huebel, Robert R., to Randall Corporation, The. Hydrocarbon gas separation. 4,519,824, Cl. 62-26.000.

Hughes Aircraft Company: *See—*
Heard, Charles M.; and Yang, Frank C., 4,520,493, Cl. 375-97.000.
Pastor, Ricardo C.; and Chew, Remedios K., 4,519,986, Cl. 423-19.000.

Hughes Helicopters, Inc.: *See—*
Logan, Andrew H.; and Wagner, Robert A., deceased, 4,519,559, Cl. 244-17.170.

Hughes Tool Company: *See—*
Burr, Bruce H., 4,519,719, Cl. 384-94.000.
Cochran, Chudleigh B., 4,519,456, Cl. 166-312.000.

Huignard, Jean-Pierre; and Malard, Marcel, to Thomson-CSF. Coherent radiation source generating a beam with a regulatable propagation direction. 4,520,484, Cl. 372-24.000.

Hulme, James H.; and Shinn, Stuart E., to Supreme Aluminum Industries Limited. Ladder extension coupling. 4,519,478, Cl. 182-178.000.

Hultmark, Dan; Steiner, Hakan; Rasmuson, Torgny; and Boman, Hans G., to KabiGen AB. Bacteriolytic proteins. 4,520,016, Cl. 514-12.000.

Hunt, Charles V.: *See—*
Holtmyer, Marlin D.; Harris, Phillip C.; and Hunt, Charles V., 4,519,455, Cl. 166-305.00R.

Hunt, Steven A., to De la Rue Systems Limited. Apparatus for detecting the condition of a sheet or web. 4,519,249, Cl. 73-596.000.

Hunter, James R.; and Lazzarotti, S. James, to Warner & Swasey Company, The. Universal sheet metal holder. 4,519,284, Cl. 83-410.000.

Hupp, Stephen S., to Ashland Oil, Inc. Process for preparing maleimide. 4,520,206, Cl. 548-548.000.

Hurst, Robert N., Jr., to RCA Corporation. Video apparatus with burst locked heterodyne chroma converter and residual time base error correction. 4,520,402, Cl. 358-324.000.

Hussmann Corporation: *See—*
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, 4,519,217, Cl. 62-256.000.

Hutchinson, Nancy K.: *See*—
Knudson, Giltner J., 4,519,334, Cl. 114-144.00R.
Huth, Klaus: *See*—
Schreiber, Peter; and Huth, Klaus, 4,520,496, Cl. 378-128.000.
Hydro Fuels, Inc.: *See*—
Russ, James J.; Smith, John W.; and Condra, Janet S., 4,519,921, Cl. 210-716.000.
Hydro-Quebec: *See*—
Gauvin, William H.; and Kubanek, George R., 4,519,835, Cl. 75-10.00R.
Hydromatik GmbH: *See*—
Wagenseil, Ludwig; and Hoffmeister, Hermann, 4,519,413, Cl. 137-111.000.
I.C.B. France Industrie et Componsants du Batiment Societe Anonyme: *See*—
Mombelli, Paup, 4,519,640, Cl. 292-33.000.
Ichida, Toshio; Kobayashi, Hideo; Ogata, Hajime; and Tsugawa, Shunichi, to Kawasaki Steel Corporation. Method of producing tin-free steel sheets. 4,519,879, Cl. 204-35.100.
Ichihara, Yoshihiro: *See*—
Bunno, Masayasu; Sugiura, Tsutomu; Tsuji, Masao; Harada, Hidemi; and Ichihara, Yoshihiro, 4,520,102, Cl. 435-61.000.
Ichimura, Yoshiaki; Noda, Atsuhito; Tokaichi, Tetsuro; and Umesato, Shoji, to Japan Aviation Electronics Industry, Limited; and NEC Corporation. Electrical connectors with quasi-terminal pins. 4,519,660, Cl. 339-75.00M.
Ide, Jushi: *See*—
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.
Ide, Kyozoh: *See*—
Komatsubara, Yoshiaki; Ide, Kyozoh; and Munakata, Eiko, 4,519,678, Cl. 350-338.000.
Idec Izumi Corporation: *See*—
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Idemitsu Kosan Company Limited: *See*—
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Igarashi, Akira: *See*—
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Igarashi, Kazumasa; Yamaguchi, Katsuhiko; Iko, Kazuo; and Miki, Kazuyuki, to Nitto Electric Industrial Co., Ltd. Siloxane-modified polyimide precursor and polyimide. 4,520,075, Cl. 428-435.000.
Iida, Kazuhiko, to Tokyo Shibaura Kenki Kabushiki Kaisha. Picture information display device. 4,520,399, Cl. 358-287.000.
Iida, Kazumi: *See*—
Umeda, Tadashi; Miyoshi, Hideo; Kishimoto, Keiichi; Iida, Kazumi; Akiyama, Kazunori; Abe, Yuji; and Taniguchi, Masato, 4,520,354, Cl. 340-679.000.
Iida, Takenobu; and Sasaki, Shunichi, to Iwasaki Electric Co., Ltd. High pressure metal vapor discharge lamp. 4,520,294, Cl. 315-50.000.
Iida, Yoshikazu: *See*—
Hagyuda, Nobuyoshi; Hasegawa, Hiroshi; Iida, Yoshikazu; and Maida, Osamu, 4,519,683, Cl. 354-127.110.
Iijima, Hiroshi: *See*—
Tanaka, Osamu; Iijima, Hiroshi; Ito, Masayoshi; and Okigawa, Etsumi, 4,519,649, Cl. 297-316.000.
Iiyama, Kazunobu: *See*—
Ishii, Mikio; Iiyama, Kazunobu; and Yazaki, Tomoyoshi, 4,520,034, Cl. 426-96.000.
Iizuka, Hirosi: *See*—
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Iizuka, Yutaka: *See*—
Seki, Yasutomo; Akiyama, Toshio; Nakabayashi, Norio; and Iizuka, Yutaka, 4,519,686, Cl. 354-200.000.
Ikawa, Kazuo: *See*—
Shioahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, 4,519,627, Cl. 280-701.000.
Ikeda, Yasuo, to Pilot Man-Nen-Hitsu Kabushiki Kaisha. Pickup device for picking up vibration transmitted through bones. 4,520,238, Cl. 179-121.00C.
Iketani, Yukiyoshi: *See*—
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Iketani, Yukiyoshi, 4,519,807, Cl. 44-15.00R.
Ikeuchi, Satoru: *See*—
Kobayashi, Tatsuhiko; Ikeuchi, Satoru; Watanabe, Kazumasa; and Suginaka, Shunji, 4,520,095, Cl. 430-223.000.
Iko, Kazuo: *See*—
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Imai, Hirosuke: *See*—
Sakata, Ko; and Imai, Hirosuke, 4,520,178, Cl. 526-200.000.
Imayoshi, Kiyoyuki, to Toyota Jidosha Kabushiki Kaisha. Method of mounting vehicle wiper mechanism. 4,519,123, Cl. 29-434.000.
Imperial Chemical Industries, PLC: *See*—
Athey, Graham, 4,520,066, Cl. 428-288.000.
Marsham, Peter R.; and Thomson, David S., 4,520,027, Cl. 514-354.000.
Imperial Clevite Inc.: *See*—
Green, Ralph R.; and Green, Robert C., 4,520,281, Cl. 307-475.000.
Ims, Dale R., to Xerox Corporation. Ink jet printing method and apparatus. 4,520,368, Cl. 346-75.000.
Inagaki, Mitsukane: *See*—
Nakayama, Shozo; Mukai, Takamitsu; Ohno, Makoto; and Inagaki, Mitsukane, 4,519,119, Cl. 29-156.50R.
Inagaki, Yoshio: *See*—
Endo, Katsusuke; and Inagaki, Yoshio, 4,520,096, Cl. 430-233.000.
INCO Europe Limited: *See*—
Shaw, Stuart W. K., 4,519,979, Cl. 420-448.000.
Industrial de Valvulas, S.A. de C.V.: *See*—
Anaya, Jose R., 4,519,414, Cl. 137-246.220.
Inion, Henri: *See*—
Rosseels, Gilbert; and Inion, Henri, 4,520,026, Cl. 514-299.000.
Inkrott, Kenneth E.; and Hawley, Gil R. Magnesium halide hydrates and polymerization catalysts prepared therefrom. 4,520,121, Cl. 502-105.000.
Inman, Frank S.; Giedt, Donald C.; and Lushis, Donald V., to Thiokol Corporation. Braided preform for refractory articles and method of making. 4,519,290, Cl. 87-7.000.
Innis, David T., to Shatterproof Glass Corp. Method and apparatus for changing sputtering targets in a magnetron sputtering system. 4,519,885, Cl. 204-192.00R.
Inoue, Hiroshi: *See*—
Yodoshi, Tatsuo; Ohata, Hiroyoshi; and Inoue, Hiroshi, 4,519,638, Cl. 285-305.000.
Inoue-Japax Research Incorporated: *See*—
Inoue, Kiyoshi, 4,520,252, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Traveling-wire EDM method and apparatus with a cooled machining fluid. 4,520,252, Cl. 219-69.00M.
Inoue, Shingo: *See*—
Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.
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Inovelf: *See*—
Guigan, Jean, 4,519,981, Cl. 422-64.000.
Institut Dr. Friedrich Forster Prufgeratebau GmbH & Co. KG.: *See*—Trautmann, Wolfgang, 4,519,243, Cl. 73-432.00R.
Institut Francais du Petrole: *See*—
Deschamps, Andre ; and Franckowiak, Sigismond, 4,519,895, Cl. 208-8.0LE.
Espitalie, Jean; Madec, Marcel; Leplat, Paul; and Paulet, Jacques, 4,519,983, Cl. 422-78.000.
Institute of Gas Technology: *See*—
Victor, John G., 4,520,213, Cl. 568-913.000.
Intel Corporation: *See*—
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,519,849, Cl. 148-1.500.
Intermountain Research & Development Corp.: *See*—
Copenhafer, William C.; and Pinsky, Michael L., 4,519,806, Cl. 23-302.00T.
International Business Machines Corporation: *See*—
Anderson, Herbert R., Jr.; Sachdev, Harbans S.; and Sachdev, Krishna G., 4,519,872, Cl. 156-643.000.
Asch, Karl; Greschner, Johann; Kallmeyer, Michael; and Kulcke, Werner, 4,520,314, Cl. 324-158.00P.
Barker, Robert B.; Davidge, Ronald V.; Gibson, David K.; and Van Cleave, George W., 4,519,700, Cl. 355-3.0SH.
Bradler, Hans J.; Brauner, Wilfried; Deyhle, Manfred; and Vogt, Karl H., 4,519,865, Cl. 156-256.000.
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Hall, John B.; and Yoshida, Takao, 4,520,032, Cl. 426-3.000.
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Strickland, James K.; and Ivey, H. Grady, 4,519,570, Cl. 249-194.000.
Iwakura, Ken; and Igarashi, Akira, to Fuji Photo Film Co., Ltd. Heat-sensitive recording materials. 4,520,377, Cl. 346-208.000.
Iwami, Isamu: *See*—
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Iida, Takenobu; and Sasaki, Shunichi, 4,520,294, Cl. 315-50.000.
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Fachini, Robert M.; Orsborn, Jesse H.; and Barrett, Monroe C., 4,519,189, Cl. 56-16.600.
Harden, Eldon A.; and Randol, Kent B., 4,519,461, Cl. 172-225.000.
Wunschl, Nicholas H.; and Robinson, Edward L., Jr., 4,519,525, Cl. 221-211.000.
Jackrel, Donald. Gas permeable-liquid impermeable membranes confined within a recess. 4,520,056, Cl. 428-68.000.
Jackson, John C., II; and Schendle, Robert N., to Sunbelt Plastics, A Division Of Sunbelt Manufacturing, Inc. Rack for boxed plastic bag rolls. 4,519,502, Cl. 206-390.000.
Jackson, John E.; Adler, Thomas A.; Quets, Jean M.; and Tucker, Robert C., Jr., to Union Carbide Corporation. High strength, wear and corrosion resistant coatings. 4,519,840, Cl. 106-1.050.
Jackson, Richard N.; and Tan, Sing L., to U.S. Philips Corporation. Television transmission system. 4,520,385, Cl. 358-12.000.
Jakubowicz, Raymond F., to Eastman Kodak Company. Motorized pipette. 4,519,258, Cl. 73-864.160.
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Japan Aviation Electronics Industry, Limited: *See*—
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Japan Steel Works, Ltd., The: *See*—
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Japan Synthetic Rubber Co., Ltd.: *See*—
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Jenkins, Derek K. Polymerization of conjugated dienes. 4,520,177, Cl. 526-151.000.
Jensen, Henning, to Common Sense Products Pty. Ltd. Multiple service unit. 4,519,657, Cl. 339-15.000.
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Jester, Willi; and Kruger, Heinrich, to Fried. Krupp Gesellschaft m.b.H. Milling cutter. 4,519,731, Cl. 407-46.000.
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Leidel, David J., 4,519,313, Cl. 102-310.000.
Jeter, Jack W., to Jeter Systems Corporation. Split label index tab. 4,520,055, Cl. 428-55.000.
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Jett, William B., Jr.; and Wilcox, Milton E., to National Semiconductor Corporation. MOS Gain controlled amplifier. 4,520,324, Cl. 330-285.000.
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Jirovetz, Andre, to Fal-Kon Investment Group. Apparatus for driving offset fasteners. 4,519,533, Cl. 227-109.000.
John Blue Company, a Division of Burnley Corporation: *See*—
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Johnson, Edwin A.; and Leung, Chun K., to Allied Corporation. Phase angle detector. 4,520,449, Cl. 364-559.000.
Johnson, Gary E.; and Van Egeren, Andrew M., to Paper Converting Machine Company. Method and apparatus for folding diapers with selective movement of orbit of tucker balde. 4,519,596, Cl. 270-32.000.
Johnson, Michael D.: *See*—
Dunmire, Robert W.; Miller, Drew J.; and Johnson, Michael D., 4,519,098, Cl. 2-161.00R.
Johnson, Robert C., to Metalogic, Inc. Expandable and contractible frame for stretching fabric material, and method. 4,519,151, Cl. 38-102.900.
Johnson, Warren K.; Goettsch, Michael R.; and Olson, Archie H., to Glenwood Manufacturing Corporation. Waste material agitator. 4,519,714, Cl. 366-285.000.
Johnson, Willard L. Filter machine. 4,519,903, Cl. 210-94.000.
Johnston, David E., to George Angus & Company Limited. Shaft seal. 4,519,616, Cl. 277-152.000.
Johnston, Douglas, to John Blue Company, a Division of Burnley Corporation. Boomless, sprayer for field application for agricultural liquids. 4,519,542, Cl. 239-1.000.
Jonelis, John A. Electrostatic precipitator construction having movable spacers. 4,519,818, Cl. 55-130.000.
Jones, Fletcher, to International Business Machines Corporation. Electron beam lithography proximity correction method. 4,520,269, Cl. 250-492.200.
Jones, Howard: *See*—
Loev, Bernard; Jones, Howard; and Suh, John T., 4,520,131, Cl. 514-156.000.
Jones, Hugh D.; and Martinich, Steven J., to GCA Corporation. On-stream cloud point analyzer. 4,519,717, Cl. 374-17.000.
Jones, Marvin R.; and Howard, Roland M., Jr., to Koomey Blowout Preventers, Inc. Fluid operated, axially reciprocating actuator. 4,519,571, Cl. 251-1.00A.
Jones, Marvin R., to Koomey Blowout Preventers, Inc. Flow controlling apparatus. 4,519,577, Cl. 251-62.000.
Jones, Paul, Jr., to Kayser-Roth Corporation. Footwear having cushion cavity. 4,519,147, Cl. 36-19.500.
Jones, Stanley P., to Emhart Industries, Inc. Controlling the temperature of a glass mould. 4,519,827, Cl. 65-29.000.
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Jorgenson, Gordon K., to C-I-L Inc. Borehole charging method including toroidal transformer cores. 4,519,314, Cl. 102-313.000.
Jovanovic, Nenad, to Bayerische Motoren Werke AG. Arrangement for enabling a pivotal mounting of a tray to a seat back of a seat of a passenger motor vehicle. 4,519,648, Cl. 297-146.000.
Joy Manufacturing Company: *See*—
Golobic, Robert A.; and Scott, Michael H., 4,519,715, Cl. 366-343.000.
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Kado, Clarence I., to University of California, The Regents of the. Tartrate catabolism gene. 4,520,106, Cl. 435-172.300.
Kaiser Aluminum & Chemical Corporation: *See*—
Barna, Gordon L.; and Lippert, James W., 4,519,442, Cl. 165-9.200.
Kakimi, Fujio; and Mikami, Takeshi, to Fuji Photo Film Co., Ltd. Encapsulated electrostatographic toner material. 4,520,091, Cl. 430-110.000.
Kakiuchi, Hiroshi, to Kabushiki Kaisha Daini Seikosha. Electrochromic display device. 4,519,930, Cl. 252-62.200.
Kalkbrenner, Ralph W.: *See*—
Kobuck, Richard M.; and Kalkbrenner, Ralph W., 4,519,593, Cl. 269-40.000.
Kallio, Leo W. Simulated baseball game. 4,519,610, Cl. 273-89.000.
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Kals, Walter, to Niagara Blower Company. Vacuum producing condenser. 4,519,450, Cl. 165-114.000.
Kaltenbach & Voigt GmbH & Co.: *See*—
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Kamada, Kazumasa; Osaka, Norihisa; and Kaneda, Masahiro, to Mitsubishi Rayon Company, Ltd. Vinyl chloride polymer composition. 4,520,166, Cl. 525-85.000.
Kamata, Nobuo; Sekiya, Takashi; Takeda, Kazutoshi; Hayasaka, Toyoo; and Yoshida, Tomohisa, to Kabushiki Kaisha Daini Seikosha. Divalent silver oxide cell including cadmium and tellurium. 4,520,087, Cl. 429-219.000.
Kamijo, Ken, to Nissan Motor Company, Limited. Strap retractor assembly. 4,519,652, Cl. 297-477.000.
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, to Mitsubishi Jukogyo Kabushiki Kaisha. Thermal cracking method for producing olefins from hydrocarbons. 4,520,224, Cl. 585-648.000.
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Kamiya, Tadashi; Kawasaki, Kazuhiro; and Muranaka, Akio, to Honda Giken Kogyo Kabushiki Kaisha. Helmet. 4,519,099, Cl. 2-424.000.
Kamiya, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,519,472, Cl. 180-227.000.

Kamperman, Charles F. Storage container. 4,519,655, Cl. 312-12.000.
Kamyr, Inc.: *See—*
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,519,446, Cl. 165-101.000.
Kanagawa Rehabilitation Center: *See—*
Tanaka, Osamu; Iijima, Hiroshi; Ito, Masayoshi; and Okigawa, Etsumi, 4,519,649, Cl. 297-316.000.
Kanaoka, Takeshi; and Shimizu, Shigehisa, to Fuji Photo Film Co., Ltd. Side printing apparatus. 4,519,701, Cl. 355-39.000.
Kanda, Kunio: *See—*
Hattori, Seiichi; and Kanda, Kunio, 4,520,458, Cl. 364-900.000.
Kaneda, Masahiro: *See—*
Kamada, Kazumasa; Osaka, Norihisa; and Kaneda, Masahiro, 4,520,166, Cl. 525-85.000.
Kaneko, Kenji, to Victor Company of Japan, Ltd. Horizontal scanning frequency multiplying circuit. 4,520,394, Cl. 358-150.000.
Kannegiesser, Martin; Mussiger, Klaus; and Dreischmeier, Wilfried, to Herbert Kannegisser GmbH & Co. Device for smoothing garments. 4,519,222, Cl. 68-5.00C.
Kanto Denka Kogyo Co., Ltd.: *See—*
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.
Kanzaki Paper Manufacturing Co., Ltd.: *See—*
Fujii, Yoshihiko; Tomita, Osamu; Taniguchi, Itaru; and Saiwai, Kazuhiko, 4,520,370, Cl. 346-76.00L.
Kanzelberger, James C., to Contemporary, Inc. Decorative plaques and process. 4,520,064, Cl. 428-199.000.
Kao Corporation: *See—*
Nakanishi, Takashi, 4,520,049, Cl. 427-356.000.
Sakurai, Akira; and Mizutani, Hiroshi, 4,519,799, Cl. 604-366.000.
Kao Soap Co., Ltd.: *See—*
Ando, Hiroshi; and Okumura, Takeo, 4,520,008, Cl. 424-47.000.
Fukumoto, Yasuhisa; and Moriyama, Noboru, 4,519,920, Cl. 210-701.000.
Kappertz, Fritz: *See—*
Zylbert, Thaddeus J.; Fuhrmann, Wolf-Dieter; Hammer, Hans; and Kappertz, Fritz, 4,519,330, Cl. 112-222.000.
Kar, Kishore K., to Dow Chemical, The. Lithium stearate aluminate as lubricant additive. 4,519,924, Cl. 252-35.000.
Karash, Karl, to GenRad, Inc. Shunt-foldback voltage source. 4,520,416, Cl. 361-11.000.
Kasanami, Takeo: *See—*
Yoshida, Iwao; Kasanami, Takeo; and Miura, Shuji, 4,519,963, Cl. 264-45.300.
Kasha, Dan: *See—*
Altman, Sidney; and Kasha, Dan, 4,520,351, Cl. 340-574.000.
Kashiwagi, Kazuo; and Toda, Takao, to Canon Kabushiki Kaisha. Projection apparatus for automatic correction of non-uniform illuminance distribution in image area of imaging plane. 4,519,694, Cl. 355-5.000.
Kashiwahara, Katsuto: *See—*
Okabe, Akira; Urushidani, Haruo; and Kashiwahara, Katsuto, 4,519,207, Cl. 60-39.182.
Katanuma, Mitsuo: *See—*
Morikawa, Kenichi; Nagatomi, Kazuyuki; and Katanuma, Mitsuo, 4,520,235, Cl. 179-99.0LS.
Kato, Hiroyasu; Yagi, Kenkichi; and Okamoto, Miyoshi, to Toray Industries, Inc. Melange-colored sheet and method of producing the same. 4,519,804, Cl. 8-485.000.
Kato, Keigo: *See—*
Kawamoto, Keiji; Kato, Keigo; and Aida, Takahiro, 4,520,126, Cl. 502-184.000.
Kato, Kiichi: *See—*
Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, 4,520,280, Cl. 307-358.000.
Kato, Takashi: *See—*
Ito, Takaaki; and Kato, Takashi, 4,519,957, Cl. 261-44.00C.
Katoh, Yuuichi; Matsuoka, Hiroki; and Iwata, Minoru, to Toyota Jidosha Kabushiki Kaisha. Fuel supply system in internal combustion engine. 4,519,354, Cl. 123-472.000.
Katz, Carlos; and Zidon, Amicam C., to Cable Technology Laboratories, Inc. Apparatus for making shrinkable tubing. 4,519,759, Cl. 425-97.000.
Katz, Philip: *See—*
Brenman, Henry S.; Katz, Philip; and Beatty, Graydon E., 4,519,400, Cl. 128-741.000.
Kauffman, Jim W.; Laughlin, William C.; and Baldwin, Roger A., to Kerr-McGee Corporation. Process for the removal of sulfate and metals from aqueous solutions. 4,519,912, Cl. 210-611.000.
Kauffman, Jim W.: *See—*
Baldwin, Roger A.; Stauter, John C.; Kauffman, Jim W.; and Laughlin, William C., 4,519,913, Cl. 210-611.000.
Kaufmann, Vendelin: *See—*
Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, 4,519,997, Cl. 423-265.000.
Kaustrater, Gert, to KUKA Wehrtechnik GmbH. Turret assembly with articulated cover for access opening. 4,519,292, Cl. 89-36.130.
Kawada, Keiichi: *See—*
Enomoto, Masaru; Kimura, Kenji; and Kawada, Keiichi, 4,519,364, Cl. 123-432.000.
Kawaguchi, Hiroshi; and Nishina, Shuho, to Toyota Jidosha Kabushiki Kaisha. Foot-operated control device for parking brake. 4,519,270, Cl. 74-535.000.
Kawaguchi, Kiyoshi; and Yamada, Muneki, to Toyo Seikan Kaisha Limited. Method for making a plastic container. 4,519,977, Cl. 264-550.000.
Kawai, Fumio: *See—*
Fujii, Hideichi; Yamane, Chiyoki; and Kawai, Fumio, 4,520,057, Cl. 428-68.000.
Kawai, Kazuhiro: *See—*
Takeuchi, Tatsuro; Yoshida, Shohei; and Kawai, Kazuhiro, 4,519,959, Cl. 261-93.000.
Kawai, Kiyoaki, to NEC Corporation. Digital transmission system. 4,520,480, Cl. 370-100.000.
Kawakami, James H.; See, Benito; Jones, Thomas R.; and Maresca, Louis M., to Union Carbide Corporation. Color improved polyarylate. 4,520,168, Cl. 525-169.000.
Kawakami, Tetsuya: *See—*
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.
Kawamata, Masaru: *See—*
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,520,443, Cl. 364-424.000.
Kawamoto, Keiji; Kato, Keigo; and Aida, Takahiro, to Mitsui Petrochemical Industries, Ltd. Catalyst composition suitable for the dimerization or codimerization of alpha-olefins. 4,520,126, Cl. 502-184.000.
Kawamura, Masaharu: *See—*
Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, 4,519,685, Cl. 354-154.000.
Kawamura, Reiki: *See—*
Terada, Takami; Nawa, Hiroshi; and Kawamura, Reiki, 4,519,650, Cl. 297-452.000.
Kawamura, Tateo: *See—*
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.
Kawaragi, Yuji: *See—*
Otake, Masayuki; Murayama, Masayoshi; and Kawaragi, Yuji, 4,520,127, Cl. 502-209.000.
Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Fujii, Hideichi; Yamane, Chiyoki; and Kawai, Fumio, 4,520,057, Cl. 428-68.000.
Kawasaki, Kazuhiro: *See—*
Kamiya, Tadashi; Kawasaki, Kazuhiro; and Muranaka, Akio, 4,519,099, Cl. 2-424.000.
Kawasaki, Nobuhiro: *See—*
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Kawasaki Steel Corporation: *See—*
Ichida, Toshio; Kobayashi, Hideo; Ogata, Hajime; and Tsugawa, Shunichi, 4,519,879, Cl. 204-35.100.
Kawase, Akio: *See—*
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Kayser-Roth Corporation: *See—*
Jones, Paul, Jr., 4,519,147, Cl. 36-19.500.
Keearns, Larry R., to E-Systems, Inc. Method of determining the position and velocity of a vehicle. 4,520,445, Cl. 364-450.000.
Keilberth, Richard: *See—*
Aldinger, Fritz; Keilberth, Richard; and Werdecker, Waltraud, 4,519,966, Cl. 264-56.000.
Keith, Robert D., to Double E Company Inc. Core chuck with resilient rollers. 4,519,620, Cl. 279-2.00R.
Kelch Corp., The: *See—*
Prepodnik, Kay E.; Finn, Peter A.; and Manning, Daniel J., 4,519,219, Cl. 62-457.000.
KELCO/AIL International Limited: *See—*
Clare, Kenneth; and Hopkinson, Erle, 4,519,803, Cl. 8-445.000.
Kelley, Douglas P., to Electric Power Research Institute, Inc. Cable following apparatus having cable cleaning capabilities and method. 4,519,462, Cl. 175-53.000.
Kellie, Truman F., to General Electric Company. Optical signal projector. 4,520,388, Cl. 358-107.000.
Kelly, Austin T.; Stolpen, Alan H.; and Emile, Philip, Jr., to Sycon Corporation. Autofunction voltmeter. 4,520,310, Cl. 324-115.000.
Kelly, Timothy A.; and Turbyfill, Rueben M., to Ventilator Associates. Vehicle escape hatch and ventilator. 4,519,645, Cl. 296-224.000.
Kendall, Robert M.: *See—*
Kesselring, John P.; Kendall, Robert M.; and Krill, Wayne V., 4,519,770, Cl. 431-7.000.
Kendig, Willard Z., to Kenna Research Corporation. Fuel flow metering apparatus. 4,519,958, Cl. 261-50.00A.
Kenmochi, Kazuei; Sakairi, Tadashi; Maruyama, Yoshio; and Itemadani, Eizi, to Matsushita Electric Industrial Co., Ltd. Combined molding and assembling apparatus. 4,519,761, Cl. 425-135.000.
Kenna Research Corporation: *See—*
Kendig, Willard Z., 4,519,958, Cl. 261-50.00A.
Kennecott Corporation: *See—*
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,519,118, Cl. 29-121.500.
Kennedy, Richard B., to Crehan, Patrick James; and Fricke, Richard J., a part interest to each. Pectin and related carbohydrates for the preparation of polyurethane foams. 4,520,139, Cl. 521-109.100.

Kenney Manufacturing Company: *See*—
Comeau, Paul E., 4,519,433, Cl. 160-126.000.
Kenton, Joseph R.: *See*—
Reusser, Robert E.; Kenton, Joseph R.; and Todd, Elizabeth A., 4,520,222, Cl. 585-526.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Knochel, Arndt; Eggers, Ingo; Klatte, Bernd; and Wilken, Rolf-Dieter, 4,519,996, Cl. 423-249.000.
Muller, Klaus-Rainer, 4,520,293, Cl. 315-5.250.
Kerr-McGee Corporation: *See*—
Baldwin, Roger A.; Stauter, John C.; Kauffman, Jim W.; and Laughlin, William C., 4,519,913, Cl. 210-611.000.
Kauffman, Jim W.; Laughlin, William C.; and Baldwin, Roger A., 4,519,912, Cl. 210-611.000.
Kesselring, John P.; Kendall, Robert M.; and Krill, Wayne V., to Alzeta Corp. Firetube boiler heater system. 4,519,770, Cl. 431-7.000.
Kidde, Inc.: *See*—
Swanson, Carl I., 4,520,348, Cl. 340-508.000.
Kienzle, Wolfgang: *See*—
Kubach, Hans; Kienzle, Wolfgang; Paschke, Werner; and Sauer, Rudolf, 4,519,547, Cl. 239-585.000.
Kieserwetter, Holger; Jung, Friedrich; Radtke, Hartmut; and Witt, Reinhard, to Kieserwetter, Holger. Apparatus for determining the flow shear stress of suspensions in particular blood. 4,519,239, Cl. 73-55.000.
Kikuchi, Itsuo: *See*—
Ishihara, Masahiro; Watanabe, Mitsuru; Ohkawa, Shuji; Taguchi, Shunichi; and Kikuchi, Itsuo, 4,520,250, Cl. 219-10.55B.
Kikuchi, Masamitsu: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.
Kikuchi, Mitsuru: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.
Kim, Dong W.: *See*—
Aberle, Leonard J.; Kim, Dong W.; Lees, Robert; Vermeer, Dick C.; Wohnig, Ernest W.; and Yates, Samuel L., 4,519,116, Cl. 28-257.000.
Kimoto, Masahiko: *See*—
Ochiai, Hideo; Hamane, Masumi; and Kimoto, Masahiko, 4,519,473, Cl. 180-229.000.
Kimoto, Toshifumi; Itami, Teruhiko; Nishimura, Nobuo; and Saitoh, Koichi, to Fuji Xerox Corporation, Limited. Thermal and magnetic recording head. 4,520,409, Cl. 360-59.000.
Kimura, Hiroshi: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Satonaka, Shinobu; Kaminaga, Seiji; and Ishito, Mitsuya, 4,519,702, Cl. 355-51.000.
Kimura, Kenji: *See*—
Enomoto, Masaru; Kimura, Kenji; and Kawada, Keiichi, 4,519,364, Cl. 123-432.000.
Kimura, Kunio: *See*—
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Iketani, Yukiyoshi, 4,519,807, Cl. 44-15.00R.
Kinder, Greever C., to Clinch River Corporation. Vibrating screening apparatus. 4,519,902, Cl. 209-234.000.
Kinetics Technology International Corp.: *See*—
Minet, Ronald G.; Dente, Mario; Ranzi, Eliseo; and Sunny H. K., 4,520,217, Cl. 585-415.000.
King-Seeley Thermos Co.: *See*—
Seltz, Charles L., 4,519,529, Cl. 222-484.000.
Kington, Alan D.: *See*—
Mills, David; Kington, Alan D.; and Lovell, Philip J., 4,520,117, Cl. 501-107.000.
Kinney, Roger D.; and Federowicz, Raymond J., to Topper International Enterprises. Awning adapted to be attached to bumper of automobile. 4,519,409, Cl. 135-88.000.
Kinney, William L., Jr.; and Evans, Richard E., Jr., to United Air Filter Company. Air filter assembly having improved clamping means for filter media. 4,519,823, Cl. 55-493.000.
Kinoda, Seiji: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,519,690, Cl. 354-324.000.
Kinoshita, Mitsuo: *See*—
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,520,253, Cl. 217-69.00W.
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., to Polaroid Corporation. Method and apparatus for processing discrete sheets of film. 4,519,689, Cl. 354-304.000.
Kinsolving, C. Richard, to Pennwalt Corporation. Use of undecylenic acid to treat herpes labialis. 4,520,132, Cl. 514-560.000.
Kirby, David, to Lutron Electronics Co., Inc. Wall mounted electrical voltage control switch. 4,520,306, Cl. 323-324.000.
Kircaldie, Randall and McNab, trustee: *See*—
Durkan, Gerald; and Sieracki, Leonard M., 4,519,387, Cl. 128-204.230.
Kirin Beer Kabushiki Kaisha: *See*—
Ono, Motoji; Hirao, Masao; and Fukushima, Shigehisa, 4,519,427, Cl. 141-65.000.
Kirk, Johnie C., to Rodriguez, Carl R., a part interest. Fishing line activator indicator. 4,519,158, Cl. 43-17.000.
Kirst, John A.; and Kutz, Daniel F., to University of New Mexico. Tone discrimination circuit. 4,520,503, Cl. 381-56.000.
Kishimoto, Keiichi: *See*—
Umeda, Tadashi; Miyoshi, Hideo; Kishimoto, Keiichi; Iida, Kazumi; Akiyama, Kazunori; Abe, Yuji; and Taniguchi, Masato, 4,520,354, Cl. 340-679.000.
Kissel, Thomas L. Yarn spinner. 4,519,198, Cl. 57-71.000.
Kistler Instrumente A.G.: *See*—
Sonderegger, Hans-Conrad; and Lutz, Eugen, 4,519,254, Cl. 73-726.000.
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, to Nippon Soken, Inc. Current frequency waveform transmitting on D.C. power lines. 4,520,359, Cl. 340-870.190.
Kitami, Takashi: *See*—
Ohyama, Kazuo; and Kitami, Takashi, 4,519,344, Cl. 123-55.0VF.
Kitamoto, Tatsuji; and Akashi, Goro, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,520,069, Cl. 428-328.000.
Kitamura, Kazuhiko, to Aisin Keiki Kabushiki Kaisha. Air suction device for diesel engine. 4,519,369, Cl. 123-337.000.
Kitamura, Sotoo: *See*—
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,520,359, Cl. 340-870.190.
Kitamura, Takashi, to Canon Kabushiki Kaisha. Collator with photoelectric bin fill detection. 4,520,263, Cl. 250-223.00R.
Kitch, Paul E.; Crochetiere, Raymond H.; Gudmundson, Gunnar G.; and Hadank, Walter R., to Algorex, Inc. Film splicing and identification system. 4,519,688, Cl. 354-297.000.
Kitsnik, Henrik M., to HK-Engineering Aktiebolag. Displacement pump suitable for pumping suspensions. 4,519,753, Cl. 417-403.000.
Kitterman, B. Layton; and Glaspie, Donald L., to Glitsch, Inc. Expanded metal saddle tower packing. 4,519,960, Cl. 261-94.000.
Kitto, David P., to Du Pont de Nemours, E. I., and Company. Method for reinforcing perfluoroelastomer compositions. 4,520,170, Cl. 525-200.000.
Kiuru, Erkki: *See*—
Sipila , Heikki; Kiuru, Erkki; and Vaijarvi, Seppo, 4,520,267, Cl. 250-358.100.
Klaeger, Karlheinz. Hand powered liquid atomizer. 4,519,527, Cl. 222-383.000.
Klar, Erhard: *See*—
Hashiguchi, Don H.; Klar, Erhard; and Dietrich, Ronald J., 4,520,130, Cl. 502-345.000.
Klatte, Bernd: *See*—
Knochel, Arndt; Eggers, Ingo; Klatte, Bernd; and Wilken, Rolf-Dieter, 4,519,996, Cl. 423-249.000.
Klee, David J., to Air Products and Chemicals, Inc. Work-holding fixture for cryogenic decoating. 4,519,171, Cl. 51-419.000.
Kleemann, Axel: *See*—
Schwarze, Werner; Kleemann, Axel; Remmel, Hans; and Hohn, Wolfgang, 4,520,209, Cl. 560-124.000.
Klein, Erwin, to BBC Aktiengesellschaft Brown, Boveri & Cie. Power semiconductor component for boiling cooling. 4,520,383, Cl. 357-81.000.
Klein, Erwin, to BBC Aktiengesellschaft Brown, Boveri & Cie. Power semiconductor component for cooling by boiling or liquids. 4,520,384, Cl. 357-82.000.
Kleinedler, Gary E.; and Pohl, Herbert A., to AT&T Technologies, Inc. High speed contact insertion facility. 4,519,132, Cl. 29-845.000.
Kline, Charles M., to Sperry Corporation. Hydraulic motor bypass apparatus. 4,519,209, Cl. 60-433.000.
Kling, John P.: *See*—
Althouse, Rickie M.; Beamenderfer, Robert E.; Durbin, Roger; Hollyday, Robert D.; and Kling, John P., 4,519,665, Cl. 339-147.00R.
Klingel, Walter C., Sr. Multi-characteristics seal member for testing uncapped container means. 4,519,618, Cl. 277-228.000.
Klintland: *See*—
Nilsson, Karl I., 4,519,104, Cl. 4-484.000.
Klocker, Otto: *See*—
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.
Klosiewicz, Daniel W., to Hercules Incorporated. Method for making a dicyclopentadiene thermoset polymer containig elastomer. 4,520,181, Cl. 525-247.000.
Kluge, Reimund; and Werner, Eberhard, to Agfa-Gevaert Aktiengesellschaft. Arrangement for projecting data onto film. 4,520,497, Cl. 378-166.000.
Kluge-Weiss, Petra, to BBC Brown, Boveri & Company Limited. Process for the thermo-migration of liquid phases. 4,519,850, Cl. 148-1.500.
Knapp, John F.; and Gruber, Robert J., to Xerox Corporation. Process for preventing deposition of toner particles in an imaging apparatus. 4,520,092, Cl. 430-120.000.
Knecht, Reinhold: *See*—
Krautkremer, Franz; Lais, Siegfried; Knecht, Reinhold; and Stache, Detlev, 4,519,335, Cl. 114-144.00R.
Knight, William A., III, to United States of America, Health and Human Services. Method for reducing toxic effects of methyl-glyoxal bis-guanylhydrazone. 4,520,031, Cl. 514-632.000.
Knochel, Arndt; Eggers, Ingo; Klatte, Bernd; and Wilken, Rolf-Dieter, to Kernforschungszentrum Karlsruhe GmbH. Method for enriching and separating heavy hydrogen isotopes from substance streams

containing such isotopes by means of isotope exchange. 4,519,996, Cl. 423-249.000.

Knopp, Hans: *See*—
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,519,115, Cl. 28-255.000.

Knowles, John P.; Wheeler, Steven A.; and Mitchell, Stewart D., to Texaco Limited. Flow line riser for offshore structure. 4,519,726, Cl. 405-195.000.

Knudson, Giltner J., to Hutchinson, Nancy K. Steering controllers for boats. 4,519,334, Cl. 114-144.00R.

Ko, Wen H.; and Leung, Albert M., to Case Western Reserve University. Pressure telemetry implant. 4,519,401, Cl. 118-748.000.

Kobayashi, Fumiaki: *See*—
Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, 4,519,353, Cl. 123-359.000.

Kobayashi, Hideo: *See*—
Ichida, Toshio; Kobayashi, Hideo; Ogata, Hajime; and Tsugawa, Shunichi, 4,519,879, Cl. 204-35.100.

Kobayashi, Hiroyuki: *See*—
Danno, Yoshiaki; Kobayashi, Hiroyuki; and Fukui, Toyoaki, 4,520,272, Cl. 290-40.00A.

Kobayashi, Hisao: *See*—
Kurahashi, Masayuki; Kobayashi, Hisao; and Deguchi, Hiroyuki, 4,519,750, Cl. 417-270.000.

Kobayashi, Minoru; and Nemoto, Shigeru, to Olympus Optical Co. Ltd. Operating lever apparatus. 4,520,415, Cl. 360-137.000.

Kobayashi, Tatsuhiko; Ikeuchi, Satoru; Watanabe, Kazumasa; and Suginaka, Shunji, to Konishiroku Photo Industry Co., Ltd. Photographic light-sensitive element. 4,520,095, Cl. 430-223.000.

Kobayashi, Tomowo: *See*—
Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, 4,520,162, Cl. 525-327.600.

Kober, Roland: *See*—
Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, 4,519,997, Cl. 423-265.000.

Kobuck, Richard M.; and Kalkbrenner, Ralph W., to Westinghouse Electric Corp. Grid assembly fixture, retention strap. 4,519,593, Cl. 269-40.000.

Kobuke, Takayoshi: *See*—
Saito, Seitoku; Izumi, Toshiaki; Kobuke, Takayoshi; and Sugihara, Hiroshi, 4,520,076, Cl. 428-611.000.

Koci, Zdenek, to Ciba Geigy Corporation. Vat dye and sulfur dye compositions. 4,519,805, Cl. 8-650.000.

Kodama, Hiroshi: *See*—
Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, 4,520,280, Cl. 307-358.000.

Koenig & Bauer Aktiengesellschaft: *See*—
Barrois, Claus D., 4,519,312, Cl. 101-349.000.
Weschenfelder, Otto T.; and Schmitt, Gunter K., 4,519,594, Cl. 270-20.100.

Koerner, Gotz: *See*—
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.

Koh, Hiroshi; and Hirota, Junichi. Lift control system. 4,520,343, Cl. 340-19.00R.

Kohashi, Takahiro: *See*—
Morishita, Hajime; Akagi, Motoo; Hayashi, Nobuaki; Nonogaki, Saburo; Uchino, Shoichi; and Kohashi, Takahiro, 4,520,094, Cl. 430-144.000.

Kohn, Gustave K.; and Bamberg, Joe T., to Zoecon Corporation. Alkoxy substituted phenoxy alkanoic acid esters. 4,520,199, Cl. 546-302.000.

Kohyama, Mitsuaki; and Toshimitsu, Kenshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Image forming apparatus including a cleaning blade and drum lubricant. 4,519,698, Cl. 355-15.000.

Kolos, Vladimir K.: *See*—
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; and Postnikov, Viktor M., 4,519,230, Cl. 72-56.000.

KoMac Enterprises, Inc.: *See*—
Olas, Richard J., 4,519,893, Cl. 206-311.000.

Komai, Hiromichi: *See*—
Ishikawa, Chuji; Iwasaki, Kyuhachiro; Horike, Masanori; and Komai, Hiromichi, 4,520,367, Cl. 346-75.000.

Komatsubara, Yoshiaki; Ide, Kyozoh; and Munakata, Eiko, to Tokyo Shibaura Denki Kabushiki Kaisha. Liquid crystal display device. 4,519,678, Cl. 350-338.000.

Kominiak, Andrew A.: *See*—
Luzzi, Glenn J.; and Kominiak, Andrew A., 4,520,229, Cl. 174-73.00R.

Kon, Shigeki: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichirou; Hayashi, Koji; and Kon, Shigeki, 4,519,862, Cl. 156-219.000.

Kondo, Kunimasa: *See*—
Kutsuna, Tomoharu; Ohtani, Shinzi; and Kondo, Kunimasa, 4,520,045, Cl. 427-294.000.

Konishi, Hideyuki: *See*—
Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, 4,519,274, Cl. 74-866.000.
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Konishiroku Photo Industry Co., Ltd.: *See*—
Kobayashi, Tatsuhiko; Ikeuchi, Satoru; Watanabe, Kazumasa; and Suginaka, Shunji, 4,520,095, Cl. 430-223.000.
Kuge, Takao, 4,519,687, Cl. 354-202.000.
Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, 4,519,691, Cl. 354-400.000.
Yamazaki, Hiroshi; and Tamaki, Kiyoshi, 4,520,090, Cl. 430-106.600.

Konrad, Charles E., to General Electric Company. Turning speed controller for electric vehicles having dual drive motors. 4,520,299, Cl. 318-587.000.

Konrath, Karl: *See*—
Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Straubel, Max, 4,519,352, Cl. 123-373.000.

Koomey Blowout Preventers, Inc.: *See*—
Jones, Marvin R.; and Howard, Roland M., Jr., 4,519,571, Cl. 251-1.00A.
Jones, Marvin R., 4,519,577, Cl. 251-62.000.

Koomey, Inc.: *See*—
Tomlin, Jerry B.; Levey, Gustave S.; and O'Neil, Michael A., 4,519,636, Cl. 285-95.000.

Koos, Rudolf, to Metripond Merleggyar. Apparatus for measuring braking actions of an automotive vehicle. 4,520,444, Cl. 364-426.000.

Kopp, Richard: *See*—
Hess, Heinrich; Grogler, Gerhard; and Kopp, Richard, 4,520,186, Cl. 528-73.000.

Kopsho, Joseph D., Jr., to Kraft Systems, Inc. Joystick. 4,520,242, Cl. 200-6.00A.

Korotaev, Jury P.: *See*—
Alkhazov, Tofik G. O.; Korotaev, Jury P.; and Vartanov, Albert A., 4,519,992, Cl. 423-230.000.

Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, to Intel Corporation. Method of making EPROM cell with reduced programming voltage. 4,519,849, Cl. 148-1.500.

Koshii & Co., Ltd.: *See*—
Fujii, Hideichi; Yamane, Chiyoki; and Kawai, Fumio, 4,520,057, Cl. 428-68.000.

Kosmatka, Walter J., to General Electric Company. Motor vehicle headlamp. 4,520,433, Cl. 362-296.000.

Kosrow, Robert L.; and Talsma, Robert C., to Union Special Corporation. Apparatus for transfering and stacking short workpiece panels. 4,519,331, Cl. 112-262.300.

Kostelitz, Michel; and Queille, Philippe, to L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude. Method of carburizing workpiece. 4,519,853, Cl. 148-16.500.

Kotian, Vijayraj M.; Blumer, Roger L.; and Herbert, William J., to Eaton Corporation. Semi-conductive heating cable. 4,520,260, Cl. 219-553.000.

Koto, Haruhiko, to Epson Corporation; and Kabushiki Kaisha Suwa Seikosha. Ink jet printing apparatus. 4,520,374, Cl. 346-140.00R.

Kotobuki Seiyaku Co., Ltd.: *See*—
Tomiyama, Tsuyoshi, 4,520,029, Cl. 514-479.000.

Koumura, Noboru, to Canon Kabushiki Kaisha. Image recording device. 4,520,400, Cl. 358-296.000.

Kovacs, Gabor: *See*—
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.

Kozuka, Michihiro: *See*—
Ajiro, Yutaka; and Kozuka, Michihiro, 4,519,788, Cl. 446-356.000.

Krabetz, Richard: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.

Kraft Systems, Inc.: *See*—
Kopsho, Joseph D., Jr., 4,520,242, Cl. 200-6.00A.

Kramer, Fritz; Skornscheck, Thomas E.; and Strauss, Ernest, to Sanifoam, Inc. Apparatus and method for applying a foam layer to cover and seal dumped waste. 4,519,338, Cl. 118-305.000.

Krause, Robert F.: *See*—
Rauch, Gary C.; and Krause, Robert F., 4,520,335, Cl. 336-212.000.

Krautkremer, Franz; Lais, Siegfried; Knecht, Reinhold; and Stache, Detlev, to Schottel-Werft Josef Becker GmbH & Co KG. Device for controlling the direction of movement and thrust force of a watercraft. 4,519,335, Cl. 114-144.00R.

Kresse, Horst: *See*—
Demus, Dietrich; Weissflog, Wolfgang; and Kresse, Horst, 4,519,936, Cl. 252-299.630.

Krieg, Edwin A.: *See*—
Ott, William E.; and Krieg, Edwin A., 4,519,482, Cl. 188-343.000.

Krill, Wayne V.: *See*—
Kesselring, John P.; Kendall, Robert M.; and Krill, Wayne V., 4,519,770, Cl. 431-7.000.

Krimmer, Erwin; and Fehrenbach, Siegfried, to Robert Bosch GmbH. Strain relief connection between a housing and an electric conductor assembly. 4,520,227, Cl. 174-65.00R.

Krines, Hans-Gebhard: *See*—
Muller, Hans-Jurgen; and Krines, Hans-Gebhard, 4,519,572, Cl. 251-29.000.

Kroeter, David W., to Kroeter, Inc. Flue fire controller. 4,519,45[illegible] Cl. 169-56.000.

Kroeter, Inc.: *See*—
Kroeter, David W., 4,519,458, Cl. 169-56.000.

Krohn, Ulrich: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,519,359, Cl. 123-668.000.

Kroil, John W., to Eaton Corporation. Fluid jet ejector. 4,520,375, Cl. 346-140.00R.

Kroll, John W.: *See*—
Hastings, Jerome K.; Brubaker, John R.; and Kroll, John W., 4,520,336, Cl. 337-140.000.

Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik: *See*—
Winter, Horst; and Eder, Erich, 4,519,186, Cl. 53-585.000.

Kronstein, Max; and Eichberg, Joseph, to American Lecithin Company. Production of paint containing lecithin-treated metal oxide. 4,520,153, Cl. 524-145.000.

Kruger, Heinrich: *See*—
Jester, Willi; and Kruger, Heinrich, 4,519,731, Cl. 407-46.000.

Ku, Ta C.: *See*—
Firth, Rowland V. D., III; Goff, Willie, Jr.; Ku, Ta C.; and Rakes, James M., 4,520,371, Cl. 346-76.0PH.

Kubach, Hans; Kienzle, Wolfgang; Paschke, Werner; and Sauer, Rudolf, to Robert Bosch GmbH. Injection valve. 4,519,547, Cl. 239-585.000.

Kubacki, Steven R. Tent construction. 4,519,410, Cl. 135-93.000.

Kubanek, George R.: *See*—
Gauvin, William H.; and Kubanek, George R., 4,519,835, Cl. 75-10.00R.

Kubis, Charles S.: *See*—
Roth, Donald J.; Kubis, Charles S.; Walter, John; and Mohr, Glenn R., 4,519,859, Cl. 156-69.000.

Kubo, Hiromasa, to Nissan Motor Company, Limited. Oxygen-sensing system. 4,519,237, Cl. 73-23.000.

Kubo, Mitsuo: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Kuboshima, Akira: *See*—
Shimizu, Hiromichi; Kuboshima, Akira; and Tanaka, Tadashi, 4,519,310, Cl. 101-35.000.

Kubota, Hirokuni: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Kubota, Ltd.: *See*—
Yoshida, Jituo; Okuyama, Shigeaki; and Suzuki, Hiroshi, 4,519,193, Cl. 56-328.00R.

Kuffer, Fernand B., to General Dynamics, Pomona Division. Multispectral target detection system with common collecting means. 4,519,707, Cl. 356 326.000.

Kuge, Takao, to Konishiroku Photo Industry Co., Ltd. Camera with vertically oriented film advance. 4,519,687, Cl. 354-202.000.

Kuhla, Donald E.: *See*—
Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., 4,520,025, Cl. 514-275.000.

KUKA Wehrtechnik GmbH: *See*—
Kaustrater, Gert, 4,519,292, Cl. 89-36.130.

Kulcke, Werner: *See*—
Asch, Karl; Greschner, Johann; Kallmeyer, Michael; and Kulcke, Werner, 4,520,314, Cl. 324-158.00P.

Kulprathipanja, Santi: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,519,952, Cl. 260-419.000.

Kumasaka, Sadao; and Tada, Satomi, to Toyo Rubber Chemical Industry Co., Ltd. Method for manufacturing phenolic resin foam. 4,520,141, Cl. 521-126.000.

Kuminecz, Jerome F.; and Lausten, Merlyn F., to United States of America, National Aeronautics and Space Administration. Spray applicator for spraying coatings and other fluids in space. 4,519,545, Cl. 239-288.000.

Kumobayashi, Hidenori: *See*—
Mitsuhashi, Shigeru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,520,212, Cl. 568-875.000.

Kunzel, Gert: *See*—
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.

Kuppinger, Gunter: *See*—
Feirer, Egon; Amann, Ulrich; and Kuppinger, Gunter, 4,519,309, Cl. 100-229.00R.

Kurahashi, Masayuki; Kobayashi, Hisao; and Deguchi, Hiroyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Variable-delivery refrigerant compressor. 4,519,750, Cl. 417-270.000.

Kuraray Co., Ltd.: *See*—
Bunno, Masayasu; Sugiura, Tsutomu; Tsuji, Masao; Harada, Hidemi; and Ichihara, Yoshihiro, 4,520,102, Cl. 435-61.000.

Kurata, Masami: *See*—
Moriguchi, Haruhiko; and Kurata, Masami, 4,520,381, Cl. 357-30.000.

Kurkov, Victor P.: *See*—
Schroeder, Albert H.; Denisevich, Peter, Jr.; Suzuki, Shigeto; and Kurkov, Victor P., 4,519,940, Cl. 252-500.000.

Kuroishi, Tadafumi: *See*—
Yoshida, Kasumi; Uchiki, Hideo; and Kuroishi, Tadafumi, 4,520,108, Cl. 436-52.000.

Kuroiwa, Katsumasa: *See*—
Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, 4,520,100, Cl. 435-13.000.

Kurozumi, Hiroshi: *See*—
Hagiwara, Zenzi; Yamamoto, Tatuo; and Kurozumi, Hiroshi, 4,519,813, Cl. 55-26.000.

Kusmierz, Hans, to Siemens Aktiengesellschaft. Connecting device for releasably securing an axle on a support plate. 4,519,723, Cl. 403-33.000.

Kutsuna, Tomoharu; Ohtani, Shinzi; and Kondo, Kunimasa, to Taiho Kogyo Co., Ltd.; and Yugenkaisha Hakusui Sangyo. Method for impregnating a die-cast article with a sealant and an impregnation apparatus therefor. 4,520,045, Cl. 427-294.000.

Kutz, Daniel F.: *See*—
Kirst, John A.; and Kutz, Daniel F., 4,520,503, Cl. 381-56.000.

Kyokuto Kaihatsu Kogyo CO., Ltd.: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., to Aluminum Company of America. Process for recycling containers. 4,519,306, Cl. 100-35.000.

La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., to Aluminum Company of America. Container recycling apparatus using scanning means to read code markings on containers. 4,519,307, Cl. 100-99.000.

Labonte, Normand: *See*—
Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Labonte, Normand, 4,519,811, Cl. 51-309.000.

LaBounty, Roy E. Metal demolition shear. 4,519,135, Cl. 30-134.000.

LaCapria, Anthony: *See*—
Gallagher, Terence J.; and LaCapria, Anthony, 4,519,155, Cl. 40-625.000.

Laing, Karsten. Intermittent through-flow collector. 4,519,380, Cl. 126-422.000.

L'Air Liquide, Societe Anonyme Pour L'Etude et L'Exploitation des Procedes Georges Claude: *See*—
Kostelitz, Michel; and Queille, Philippe, 4,519,853, Cl. 148-16.500.

Lais, Siegfried: *See*—
Krautkremer, Franz; Lais, Siegfried; Knecht, Reinhold; and Stache, Detlev, 4,519,335, Cl. 114-144.00R.

Laiteries E. Bridel: *See*—
Rialland, Jean P.; and Barbier, Jean P., 4,520,036, Cl. 426-271.000.

Lakdawala, Ness: *See*—
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, 4,519,217, Cl. 62-256.000.

Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Labonte, Normand, to Societe Nationale de l'Amiante. Calcined serpentine useful as sandblasting agent. 4,519,811, Cl. 51-309.000.

Lam Shang Leen, Kee K., to Centre de Recherche Industrielle du Quebec. Process for the preparation of a crystalline titanoborosilicate. 4,519,998, Cl. 423-277.000.

Lambert, Ronald F.: *See*—
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,519,689, Cl. 354-304.000.

Lamonica, Mark A. Pizza dough package and method of making same. 4,520,035, Cl. 426-128.000.

Landgraf, Helmut; and Stucke, Walter, to Mannesmann Aktiengesellschaft. Method and device for jacketing a steel pipe with several plastic materials. 4,519,863, Cl. 156-244.120.

Lang, Manfred: *See*—
Spinner, Georg; Lang, Manfred; and Pautz, Anton, 4,519,670, Cl. 350-96.150.

Langdon, William K., to BASF Wyandotte Corporation. Acetal group-containing non-ionic surfactants. 4,519,950, Cl. 260-404.000.

Lange, Bradley N.: *See*—
Allred, Laurence L., Jr.; and Lange, Bradley N., 4,520,313, Cl. 324-158.00R.

Langer, Salomon: *See*—
Cavero, Icilio; and Langer, Salomon, 4,520,030, Cl. 514-629.000.

Langheck, Richard, to Wilhelm Sihn Jr. KG. Telescoping antenna with actuating gear driven cable. 4,520,365, Cl. 343-903.000.

Langhorst, Martin A.: *See*—
Stevens, Timothy S.; and Langhorst, Martin A., 4,519,905, Cl. 210-198.200.

Lapinoja, Lonnie L., to General Signal Corporation. Retainer for a replaceable valve seat. 4,519,583, Cl. 251-328.000.

Laporte Industries Limited: *See*—
Robinson, Michael, 4,519,987, Cl. 423-60.000.

Larkin, William J. Anti-reverse siphon solar heating system. 4,519,383, Cl. 126-430.000.

Larock, Richard C., to Iowa State University Research Foundation, Inc. Synthesis of thiophene-containing prostaglandin endoperoxide analogs. 4,520,207, Cl. 549-79.000.

Larsen, Leif G. Thread measuring tool. 4,519,144, Cl. 33-199.00R.

Larws, Peter. Toy-figure. 4,519,786, Cl. 446-97.000.

Latimer, Stanley M.; and Orton, Gregory A., to Ampex Corporation. Magnetic transducer structure with improved mechanical coupling and method of manufacturing. 4,520,414, Cl. 360-125.000.

Lau, Pauline Y.: *See—*
Xu, Zhong, 4,520,268, Cl. 250-492.100.

Lau, Roland L.: *See—*
Xu, Zhong, 4,520,268, Cl. 250-492.100.

Laughlin, William C.: *See—*
Baldwin, Roger A.; Stauter, John C.; Kauffman, Jim W.; and Laughlin, William C., 4,519,913, Cl. 210-611.000.
Kauffman, Jim W.; Laughlin, William C.; and Baldwin, Roger A., 4,519,912, Cl. 210-611.000.

Lausten, Merlyn F.: *See—*
Kuminecz, Jerome F.; and Lausten, Merlyn F., 4,519,545, Cl. 239-288.000.

Lavarini, Bernard, to Compagnie General D'Electricite. Gas flow laser oscillator. 4,520,486, Cl. 372-95.000.

Laverty, Michael P.: *See—*
Enter, Rudolf; and Laverty, Michael P., 4,520,270, Cl. 250-560.000.

Lavezzari, Carlo, to Zincroksid S.p.A. Process for the protection of galvanized steel rolled sections with a two layer chromium-chromate coating. 4,520,077, Cl. 428-632.000.

Laviron, Andre ; and Berard, Claude, to Commissariat a l'Energie Atomique. System for testing the malfunctioning or correct operation of a circuit with logic components. 4,520,309, Cl. 324-73.00R.

Laviron, Charles; Lecouls, Henri; and Mesaros, Louis. Process for the purification of sulfuric acid by-product from boron trifluoride synthesis. 4,520,006, Cl. 423-531.000.

Lazzara, Richard J., to Neptune Research, Inc. Resin-cloth structural system. 4,519,856, Cl. 156-49.000.

Lazzarotti, S. James: *See—*
Hunter, James R.; and Lazzarotti, S. James, 4,519,284, Cl. 83-410.000.

Le, Tam D.; and Turner, Weems D., to Baker Oil Tools, Inc. Positive engagement safety mechanism and lift belt construction for long stroke, well pumping unit. 4,519,262, Cl. 74-89.200.

League, John S., IV, to Mineral Processing Systems, Inc. Solidified charge protection control for rotating apparatus. 4,520,297, Cl. 318-490.000.

Learnard, Stanley J. Rotatable display stand. 4,519,510, Cl. 211-131.000.

LeaRonal, Inc.: *See—*
McCaskie, John E.; and Tsiamis, Chris, 4,520,046, Cl. 427-304.000.

Lecompte, Michel: *See—*
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, 4,519,217, Cl. 62-256.000.

Lecouls, Henri: *See—*
Laviron, Charles; Lecouls, Henri; and Mesaros, Louis, 4,520,006, Cl. 423-531.000.
Metzger, Jean; Lecouls, Henri; Colombe , Philippe; and Wojcik, Jean, 4,520,001, Cl. 423-332.000.

Le Creurer, Maurice: *See—*
Sedille, Marcel; and Le Creurer, Maurice, 4,519,211, Cl. 60-602.000.

Ledebuhr, Richard L.; and Hansen, Clarence M., to Michigan State Univ., Board of Trustees of. Strawberry harvester and procedures for growing and harvesting of such fruit. 4,519,191, Cl. 56-331.000.

Lee, Chung H.; Fronduto, John; and Oettinger, Peter E., to Thermo Electron Corporation. Electrolytic deposition of metals on laser-conditioned surfaces. 4,519,876, Cl. 204-15.000.

Lee, Shy-Fuh, to Zoecon Corporation. Tetrahydrobenzodiazaphosphorindiones and tetrahydropyridodiazaphosphorindiones. 4,520,197, Cl. 546-21.000.

Lees, Robert: *See—*
Aberle, Leonard J.; Kim, Dong W.; Lees, Robert; Vermeer, Dick C.; Wohnig, Ernest W.; and Yates, Samuel L., 4,519,116, Cl. 28-257.000.

Leftault, Charles J., Jr.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.

I eggett & Platt, Incorporated: *See—*
Gullett, Edwin P.; Davis, Gerald B.; and Bustos, Rafael T., 4,519,508, Cl. 211-59.200.

Lehigh Press, Inc., The: *See—*
DeSanto, Ronald F., 4,519,597, Cl. 270-42.000.

Lehman, Richard F.; Porth, Roland W.; and Mason, Lawrence J., to Xerox Corporation. Document reproduction device utilizing a selective color illuminator. 4,519,703, Cl. 355-69.000.

Lehmann, Klaus; Dreher, Dieter; Rauch, Hubert; and Siol, Werner, to Rohm GmbH. Method for coating medicaments. 4,520,172, Cl. 525-369.000.

Leidel, David J., to Jet Research Center, Inc. Charge holder. 4,519,313, Cl. 102-310.000.

Leighton, Francis; and Trebes, Fred W., to Air Dry Corporation. Safe high pressure instrument valve. 4,519,580, Cl. 251-223.000.

Leinen, Roger W., to Minnesota Mining and Manufacturing Company. Aerosol application of encapsulated materials. 4,520,142, Cl. 523-205.000.

Leitermann, Wulf; and Heneka, Rolf, to Audi NSU Auto Union Aktiengesellschaft. Rearward facing collapsible vehicle back seat. 4,519,646, Cl. 297-15.000.

Leland, Ragnvald G. Combination exercise and massage apparatus. 4,519,605, Cl. 272-116.000.

Leland Stanford Junior University, The Board of Trustees of the: *See—*
Fu, Chong-Cheng; and Gerzberg, Levy, 4,519,260, Cl. 73-861.250.
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., 4,520,110, Cl. 436-501.000.

Leneveu, Louis J. J.; and Treneules, Didier J., to Societe Nationale des Poudres et Explosifs. Mixed charges for ammunitions with a casing constituted by agglomerated propellant powder and propellant powder in grain form. 4,519,855, Cl. 149-21.000.

Lenhart, Richard D.; and Lindblad, Roger D., to Zot Manufacturing Company. Modular rake shaft assembly. 4,519,609, Cl. 273-54.00A.

Leo, Reinhard W. Flat link band of wire coils, wire coil for the production of such a link band and process for the production of such a wire coil. 4,520,065, Cl. 428-222.000.

Leplat, Paul: *See—*
Espitalie, Jean; Madec, Marcel; Leplat, Paul; and Paulet, Jacques, 4,519,983, Cl. 422-78.000.

Lepper, Eberhard; and Lust, Karl-Heinz, to Arthur Pfeiffer Vakuumtechnik Wetzlar GmbH. Electric motor drive arrangement. 4,520,296, Cl. 318-254.000.

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Leung, Albert M.: *See—*
Ko, Wen H.; and Leung, Albert M., 4,519,401, Cl. 118-748.000.

Leung, Chun K.: *See—*
Johnson, Edwin A.; and Leung, Chun K., 4,520,449, Cl. 364-559.000.

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Levert, Frederick J., Jr.: *See—*
Mott, George E.; and Levert, Frederick J., Jr., 4,519,725, Cl. 405-195.000.

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Greenwood, Christopher J., 4,519,485, Cl. 192-0.033.

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Petr, Jan; and Steinle, Benedikt, 4,520,311, Cl. 324-117.00R.

Libbey, Robert L.: *See—*
Dischert, Robert A.; and Libbey, Robert L., 4,520,396, Cl. 358-167.000.

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Weber, Herbert, 4,520,492, Cl. 375-86.000.

Lidorenko, Nikolai S.: *See—*
Gudkin, Timofei S.; Iordanishvili, Evgeny K.; Lidorenko, Nikolai S.; Malkovich, Bella E.; Razumovsky, Mikhail I.; and Rubashov, Igor B., 4,519,389, Cl. 128-303.100.

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Lin, Jiang-Jen; and Duranleau, Roger G., to Texaco Inc. Process for selectively preparing acetic anhydride by carbonylation of methyl acetate in the presence of an iodide-free catalyst system. 4,519,956, Cl. 260-549.000.

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Lenhart, Richard D.; and Lindblad, Roger D., 4,519,609, Cl. 273-54.00A.

Lindstrom, Gerald D.; Eckhart, Clifford F.; Farthing, George A., Jr.; Muckley, James J.; and Taylor, Brian E., to Babcock & Wilcox Company, The. Low pressure loss burner for coal-water slurry or fuel oil. 4,519,322, Cl. 110-264.000.

Lingua, Robert W. Hemostasing muscle clips for needleless surgery. 4,519,392, Cl. 128-325.000.

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Lipinski, Reinhard, to PROMA Produkt-und Marketing Gesellschaft mbH. Sealed motion transfer apparatus utilizing a pressure fluid cylinder. 4,519,297, Cl. 92-88.000.

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Shank, William E.; and Bercaw, Kenneth K., 4,519,722, Cl. 403-26.000.
Liu, Dean-Yuan, to Sanders Associates, Inc. Plotter paper loading assist apparatus. 4,520,372, Cl. 346-136.000.
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Luce, Robert S.; Quinn, Ross A.; and Rowley, Leroy S., 4,519,710, Cl. 356-411.000.
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Loeding, Neil W.: *See*—
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Petermann, Harald; and Loesch, Karl G., 4,519,166, Cl. 51-103.0WH.
Loev, Bernard; Jones, Howard; and Suh, John T., to USV Pharmaceutical. Antihypertensive N-substituted 1,4-dihydropyridines. 4,520,131, Cl. 514-156.000.
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Logvinov, Anatoly A.; Milov, Vladimir N.; Ostrenko, Nikolai S.; Demyanovich, Nikolai A.; Antonov, Vladimir A.; Abdulin, Fen Z.; and Berdiev, Oleg S. Casting-by-squeezing mold. 4,519,437, Cl. 164-284.000.
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Long, Gary E.: *See*—
Fields, Gary C.; and Long, Gary E., 4,520,234, Cl. 179-2.00A.
Long, Noel V.; and Mierke, Charles H., to Union Carbide Corporation. Lead attachment for tantalum anode bodies. 4,520,430, Cl. 361-433.000.
Lopez, Sergio: *See*—
Hascal, Marcel; Watson, Donald A.; Danielski, Andrew; and Lopez, Sergio, 4,520,318, Cl. 324-457.000.
Lorenz, Hellmut: *See*—
Dammann, Peter; Lorenz, Hellmut; and Maier, Roland, 4,519,204, Cl. 57-340.000.
Loskorn, Richard A., to Burroughs Corporation. Memory selection in a multiple line adapter organization. 4,520,452, Cl. 364-900.000.
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Mills, David; Kington, Alan D.; and Lovell, Philip J., 4,520,117, Cl. 501-107.000.
Lowe, David A.; Romancik, Guna; Cappelletti, Leonardo M.; and Elander, Richard P., to Bristol-Myers Company. Production of cephalosporin C. 4,520,101, Cl. 435-49.000.
Lowe, Lynnwood, to Pitney Bowes Inc. Auxiliary printing device for a postage meter. 4,519,311, Cl. 101-109.000.
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Bravenec, Thomas H.; Boyd, Roger L.; and Ferenc, Robert R., 4,519,974, Cl. 264-279.000.
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Edgar, Albert D.; and Lubart, Neil D., 4,520,391, Cl. 358-133.000.
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Higgins, William A., 4,520,155, Cl. 524-166.000.
Smith, Donald M., 4,519,925, Cl. 252-48.600.
Lucas Industries: *See*—
Birt, David A., 4,520,434, Cl. 362-309.000.
Lucas Industries Inc.: *See*—
Spencer, Byron A. T., 4,519,417, Cl. 137-501.000.
Lucas Industries Limited: *See*—
Nicholls, Lawrence G., 4,519,481, Cl. 188-322.170.
Lucas Industries, public limited company: *See*—
Archer, Michael A., 4,519,351, Cl. 123-357.000.
Moloney, Kieron J., 4,519,299, Cl. 92-129.000.
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Ludvigsen, Erik, to Alfa-Laval Separation A/S. Conveyor screw with wear-resistant members attached to its operative surface. 4,519,496, Cl. 198-676.000.
Luitz, Max; and Weiss, Eugen, to Ess GmbH Skibindungen. Ski binding. 4,519,625, Cl. 280-633.000.
Lundberg, Robert D.: *See*—
Peiffer, Dennis G.; Lundberg, Robert D.; Duvdevani, Ilan; and Thaler, Warren A., 4,520,158, Cl. 524-481.000.
Lushis, Donald V.: *See*—
Inman, Frank S.; Giedt, Donald C.; and Lushis, Donald V., 4,519,290, Cl. 87-7.000.
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Lussiez, Guy W. Spelling game. 4,519,606, Cl. 273-1.00R.
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Lepper, Eberhard; and Lust, Karl-Heinz, 4,520,296, Cl. 318-254.000.
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Kirby, David, 4,520,306, Cl. 323-324.000.
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Sonderegger, Hans-Conrad; and Lutz, Eugen, 4,519,254, Cl. 73-726.000.
Lutz, Manfred: *See*—
Dumbser, Gerhard; Lutz, Manfred; Fey, Rainer; and Weiss, Kurt, 4,519,227, Cl. 70-264.000.
Luzzi, Glenn J.; and Kominiak, Andrew A., to Amerace Corporation. Splice connector housing and assembly of cables employing same. 4,520,229, Cl. 174-73.00R.
Lyons, James E.: *See*—
Hsu, Chao-Yang; and Lyons, James E., 4,519,948, Cl. 260-396.00R.
MacDowell, John F.: *See*—
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,519,828, Cl. 65-33.000.
Machine Technology, Inc.: *See*—
Hillman, Gary, 4,519,526, Cl. 222-212.000.
Machtle, Roland, to Werkzeugfabrik Fritz Machtes GmbH & Co. K.G. Expansion anchor. 4,519,735, Cl. 411-65.000.
Madan, Arun: *See*—
Ovshinsky, Stanford R.; and Madan, Arun, 4,520,380, Cl. 357-2.000.
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Uesugi, Kenji; Irie, Shin-ichi; Asada, Yoshihisa; Maeda, Masahiro; Yamada, Nobuyuki; and Nakagawa, Hideaki, 4,520,230, Cl. 174-107.000.
Maeda, Satoru: *See*—
Todokoro, Shigeru; Nakane, Hiroshi; and Maeda, Satoru, 4,520,469, Cl. 369-44.000.
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, to Hoxan Corporation. Apparatus for fabricating polycrystalline silicon wafer. 4,519,764, Cl. 425-256.000.
Magic Chef, Inc.: *See*—
Mandel, Sheldon W., 4,519,145, Cl. 34-27.000.
Magna American Corporation: *See*—
Reaume, Leonard V., 4,519,459, Cl. 172-42.000.
Magna-Graphics Corporation: *See*—
Wittkopf, Eugene W.; Jorgensen, Allen R.; and Daane, Robert A., 4,519,757, Cl. 425-143.000.
Magnusson, Stig E.: *See*—
Simmons, Nathaniel; Puccini, Sergio E.; Magnusson, Stig E.; and Parikh, Kamal I., 4,520,478, Cl. 370-63.000.
Maguire, Edward A.: *See*—
Gentilman, Richard L.; Maguire, Edward A.; and Dolhert, Leonard E., 4,520,116, Cl. 501-98.000.
Maher, Elizabeth A.: *See*—
Burrington, James D.; Pesa, Fred A.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,519,954, Cl. 260-465.80D.
Maida, Osamu: *See*—
Hagyuda, Nobuyoshi; Hasegawa, Hiroshi; Iida, Yoshikazu; and Maida, Osamu, 4,519,683, Cl. 354-127.110.
Maier, Roland: *See*—
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Ribas, Jean L., 4,519,724, Cl. 403-345.000.
Makiel, Joseph M., to United States of America, Energy. Fuel cell generator. 4,520,082, Cl. 429-26.000.
Makihara, Hiroshi: *See*—
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, 4,520,224, Cl. 585-648.000.
Makino, Tomoaki, to Mitsubishi Denki Kabushiki Kaisha. Optimized display device memory utilization. 4,520,358, Cl. 340-799.000.
Malard, Marcel: *See*—
Huignard, Jean-Pierre; and Malard, Marcel, 4,520,484, Cl. 372-24.000.
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Gudkin, Timofei S.; Iordanishvili, Evgeny K.; Lidorenko, Nikolai S.; Malkovich, Bella E.; Razumovsky, Mikhail I.; and Rubashov, Igor B., 4,519,389, Cl. 128-303.100.
Mallonen, Edward A.: *See*—
Forsell, Kenneth A.; and Mallonen, Edward A., 4,520,244, Cl. 200-67.0DA.
Malloy, Thomas P.: *See*—
Berg, Roy C.; Malloy, Thomas P.; and Vora, Bipin V., 4,520,218, Cl. 585-449.000.
Malvern Scale Company: *See*—
Stuart, James M., 4,519,464, Cl. 177-244.000.
Mandel, Sheldon W., to Magic Chef, Inc. Electrostatic and moisture control system for automatic clothes dryers. 4,519,145, Cl. 34-27.000.
Mandl, Gerhard: *See*—
Weber, Kurt; Mondini, Giancarlo; and Mandl, Gerhard, 4,519,821, Cl. 55-290.000.
Mandler, John J., Jr.: *See*—
Epstein, Paul; Ballas, John S., Jr.; Mandler, John J., Jr.; and Van Horn, Joseph M., 4,519,396, Cl. 128-698.000.

Manis, Paul A.: *See*—
Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,520,176, Cl. 524-598.000.

Mannesmann Aktiengesellschaft: *See*—
Hillemanns, Herbert; Samans, Robert; and Meyer, Walter, 4,520,047, Cl. 427-331.000.
Landgraf, Helmut; and Stucke, Walter, 4,519,863, Cl. 156-244.120.

Mannesmann Rexroth GmbH: *See*—
Bartholomaus, Reiner; and Rivolier, Michel, 4,519,573, Cl. 251-30.000.

Manning, Daniel J.: *See*—
Prepodnik, Kay E.; Finn, Peter A.; and Manning, Daniel J., 4,519,219, Cl. 62-457.000.

Mansfield, Robert J.; Payne, David N.; and Sasaki, Issei, to National Research Development Corporation. Measurement of optical refractive index profiles. 4,519,704, Cl. 356-73.100.

Manzi, Joseph, to Gossling Development Corporation. Hanger device for long handled implements. 4,519,566, Cl. 248-360.000.

Marentic, Frank J., to Minnesota Mining and Manufacturing Company. Layered composite for applying graphics having areas or both mirror-like metal and patterned appearance. 4,520,053, Cl. 428-31.000.

Maresca, Louis M.: *See*—
Kawakami, James H.; See, Benito; Jones, Thomas R.; and Maresca, Louis M., 4,520,168, Cl. 525-169.000.

Mark, Victor; and Hedges, Charles V., to General Electric Company. Polycarbonates and polyester carbonates exhibiting improved heat resistance. 4,520,187, Cl. 528-176.000.

Marketing Displays, Inc.: *See*—
Seely, James R.; and Sarkisian, Robert, 4,519,152, Cl. 40-156.000.

Marks, Christopher: *See*—
Williams, Robert L.; and Marks, Christopher, 4,519,666, Cl. 339-177.00R.

Marks, Rex B.: *See*—
Gill, Dee R.; and Marks, Rex B., 4,519,869, Cl. 156-428.000.

Mars Incorporated: *See*—
McLaughlin, Donald L., 4,520,451, Cl. 364-900.000.

Marsham, Peter R.; and Thomson, David S., to Imperial Chemical Industries PLC. Anti-inflammatory esters of 4-(1-hydroxy-2-[(acylamino)alkylamino]ethyl) phenols. 4,520,027, Cl. 514-354.000.

Martin Automatic, Inc.: *See*—
Martin, John R., 4,519,858, Cl. 156-64.000.

Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., to SWS Silicones Corporation. Textile finishing compositions. 4,520,176, Cl. 524-598.000.

Martin, John R., to Martin Automatic, Inc. Splicer. 4,519,858, Cl. 156-64.000.

Martin Marietta Corporation: *See*—
Gerber, Arthur H., 4,519,842, Cl. 106-90.000.

Martin, Millard J.: *See*—
Adomis, Peter P., Jr.; and Martin, Millard J., 4,519,300, Cl. 92-158.000.

Martin, Raymond G. Badminton shuttlecock. 4,519,613, Cl. 273-417.000.

Martinich, Steven J.: *See*—
Jones, Hugh D.; and Martinich, Steven J., 4,519,717, Cl. 374-17.000.

Martinola, Friedrich, to Bayer Aktiengesellschaft. Process for internal regeneration of ion exchanger resins in mixed bed filters, and mixed bed filters for carrying out the process. 4,519,916, Cl. 210-678.000.

Martinola, Friedrich, to Bayer Aktiengesellschaft. Counter-current adsorption filters for the treatment of liquids and a method of operating the filter. 4,519,917, Cl. 210-678.000.

Marty, Claude; and Engelhard, Philippe, to Compagnie Francaise de Raffinage. Process for the pretreatment of light olefin fractions. 4,520,225, Cl. 585-832.000.

Marusik, C. Lee, to Rockwell International Corporation. Master and slave power supply control circuits. 4,520,275, Cl. 307-64.000.

Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, to Kabushiki Kaisha Komatsu Seisakusho. Automatic speed range change-over system for a hydro-mechanical transmission. 4,519,274, Cl. 74-866.000.

Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, to Kabushiki Kaisha Komatsu Seisakusho. Turning control system for a hydro-mechanical transmission. 4,519,275, Cl. 74-866.000.

Maruyama, Yoshio: *See*—
Kenmochi, Kazuei; Sakairi, Tadashi; Maruyama, Yoshio; and Itemadani, Eizi, 4,519,761, Cl. 425-135.000.

Masayuki, Maeda: *See*—
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.

Maschinenfabrik Muller-Weingarten AG: *See*—
Feirer, Egon; Amann, Ulrich; and Kuppinger, Gunter, 4,519,309, Cl. 100-229.00R.

Mase, Syunzo: *See*—
Matsuzawa, Soichiro; and Mase, Syunzo, 4,519,870, Cl. 156-603.000.

Mashiko, Koichiro, to Mitsubishi Denki Kabushiki Kaisha. Dynamic random access memory. 4,520,466, Cl. 365-210.000.

Masino, Leo, to E. Th. Noack Verpackungsmaschinen. Method for boxing bubble strips. 4,519,282, Cl. 83-85.000.

Maslanka, William W., to Hercules Incorporated. Process for producing polyaminopolyamides containing halohydrin functionality. 4,520,159, Cl. 524-606.000.

Mason, David A. Rear extension for boat hull. 4,519,336, Cl. 114-286.000.

Mason, Lawrence J.: *See*—
Lehman, Richard F.; Porth, Roland W.; and Mason, Lawrence J., 4,519,703, Cl. 355-69.000.

Massachusetts Institute of Technology: *See*—
Ham, Norman D., 4,519,743, Cl. 416-1.000.

Mast, Fred; and Waser, Rudolf, to GRETAG Aktiengesellschaft. Optical image amplifier. 4,519,682, Cl. 353-122.000.

Masters, Edward R.: *See*—
Fanelli, Michael W.; and Masters, Edward R., 4,520,431, Cl. 362-180.000.

Matsubara, Mitsuyoshi: *See*—
Arita, Masataka; and Matsubara, Mitsuyoshi, 4,520,494, Cl. 378-108.000.

Matsuda, Shunsuke; Mitani, Katsuaki; Yoda, Hironori; and Nishizawa, Kesaji, to Matsushita Electric Industrial Co., Ltd.; and Nissei Plastic Industrial Co., Ltd. Apparatus for injection compression molding. 4,519,763, Cl. 425-192.00R.

Matsui, Kazuma: *See*—
Oyobe, Kazuo; Nomura, Etsuji; Matsui, Kazuma; Fukutani, Masanori; Ito, Kazuyuki; Miwa, Naoto; and Ito, Keiji, 4,519,820, Cl. 55-284.000.

Matsumoto, Hidekazu: *See*—
Bandoh, Tadaaki; Matsumoto, Hidekazu; Fukunaga, Yasushi; Hiraoka, Ryosei; Ide, Jushi; and Kawakami, Tetsuya, 4,520,441, Cl. 364-200.000.

Matsuoka, Hiroki: *See*—
Katoh, Yuuichi; Matsuoka, Hiroki; and Iwata, Minoru, 4,519,354, Cl. 123-472.000.

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Kenmochi, Kazuei; Sakairi, Tadashi; Maruyama, Yoshio; and Itemadani, Eizi, 4,519,761, Cl. 425-135.000.
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Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Iketani, Yukiyoshi, 4,519,807, Cl. 44-15.00R.
Soga, Mamoru; Yubakami, Keiichi; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,519,931, Cl. 252-62.510.
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,520,485, Cl. 372-48.000.
Tao, Muneo; and Migaki, Fumihiko, 4,519,775, Cl. 431-344.000.
Yokozeki, Seiki, 4,520,251, Cl. 219-10.55M.
Yoshii, Tetsuji, 4,519,521, Cl. 220-335.000.

Matsushita Electric Works, Ltd.: *See*—
Nagamoto, Mitsuki, 4,520,333, Cl. 335-129.000.

Matsushita, Toshihiko; and Morishita, Sadao, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording paper and a process for production thereof. 4,520,378, Cl. 346-209.000.

Matsushita, Toshihiko: *See*—
Morishita, Sadao; and Matsushita, Toshihiko, 4,520,376, Cl. 346-204.000.

Matsushita, Yoshihiro: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,520,194, Cl. 544-22.000.

Matsuzawa, Soichiro; and Mase, Syunzo, to NGK Insulators, Ltd. Method for producing a single crystal. 4,519,870, Cl. 156-603.000.

Mattei, Riccardo, to G.D. Societa per Azioni. Device for applying filters to cigarettes. 4,519,406, Cl. 131-94.000.

Mattel, Inc.: *See*—
Halford, Wayne R.; Renger, Larry H.; and Dooley, James J., 4,519,789, Cl. 446-444.000.

Matusiro, Ryuiti: *See*—
Iwamoto, Kenji; Moriguchi, Kouichi; and Matusiro, Ryuiti, 4,519,210, Cl. 60-602.000.

Maure, Jean, to Societe Anonyme des Plieuses Automatiques. Wrapping machine. 4,519,180, Cl. 53-234.000.

Mauser-Werke Oberndorf GmbH: *See*—
Gotz, Udo; Gleichauf, Winfried; Gunther, Oswin; and Hoffmann, Dietrich, 4,519,117, Cl. 29-1.200.

Maxcap, Inc.: *See*—
Nolan, Robert L., 4,519,569, Cl. 249-142.000.

May, Michael G. Method and apparatus for controlling the composition of the combustion charge in internal combustion engines. 4,519,366, Cl. 123-435.000.

Mayer, Edward F.; and van Blerk, Victor B., to Ricoh Company, Ltd. Electrophotographic copying apparatus including toner cleaning arrangement. 4,519,699, Cl. 355-15.000.

Mayer, Theodore W., to R. R. Donnelley & Sons Company. Method and apparatus for tandem stitching of books in a bindery line. 4,519,599, Cl. 270-53.000.

Mayer, William; and Runions, Alton E., to Stewart-Warner Corporation. Rectangular halogen lamp unit and method of manufacture. 4,520,432, Cl. 362-267.000.

Mazda Motor Corporation: *See*—
Nagaoka, Mitsuru; Oda, Kazuya; and Sumida, Shizuo, 4,519,484, Cl. 192-3.580.
Oda, Hiroyuki; Morita, Yasuyuki; and Nagao, Akihito, 4,519,350, Cl. 123-308.000.

McAllister, Don M., to Am-Air Limited Partnership. Air ionizer for internal combustion engines. 4,519,357, Cl. 123-539.000.

McAuliffe, Robert E., to Outboard Marine Corporation. State of charge indicator. 4,520,353, Cl. 340-636.000.

McBrayer, Carl L. Means for killing flying insects and for discharging an attractant therefrom. 4,519,160, Cl. 43-113.000.

McCain, William B.; and Bewersdorf, Elmer, to McCian Manufacturing Corporation. Signature gathering machine with segment wheel calibrated to main drive shaft. 4,519,598, Cl. 270-53.000.

McCann, John J.: *See*—
Burkhardt, James L.; and McCann, John J., 4,520,403, Cl. 358-332.000.
McCaskie, John E.; and Tsiamis, Chris, to LeaRonal, Inc. Metal plating on plastics. 4,520,046, Cl. 427-304.000.
McCian Manufacturing Corporation: *See*—
McCain, William B.; and Bewersdorf, Elmer, 4,519,598, Cl. 270-53.000.
McCray, William R. Fence post driver. 4,519,584, Cl. 254-29.00R.
McElwee, J. Russell, to Photo Vending Corporation. Apparatus and method for storing and retrieving articles. 4,519,522, Cl. 221-13.000.
McEvoy, John C.; and Thomas, Leslie P., to Diamond Automations, Inc. Egg handling system. 4,519,494, Cl. 198-448.000.
McGarr, Clarence D. Heated water-alcohol injection system for carbureted internal combustion engines. 4,519,341, Cl. 123-1.00A.
McGill, Eugene C.; and Bell, Ronald D., to McGill Incorporated. Process of conversion for disposal of chemically bound nitrogen in industrial waste gas streams. 4,519,993, Cl. 423-235.000.
McGill Incorporated: *See*—
McGill, Eugene C.; and Bell, Ronald D., 4,519,993, Cl. 423-235.000.
McGinnis, Roger N.; Drehman, Lewis E.; and Pitzer, Emory W. Dehydrogenation process. 4,520,223, Cl. 585-629.000.
McIntyre, Raymond E. Electrical plug and socket connection device. 4,520,243, Cl. 200-51.070.
McLaughlin, Donald L., to Mars Incorporated. Programmable vending machine accountability apparatus. 4,520,451, Cl. 364-900.000.
McLean, Kenneth W.: *See*—
Webster, Emmett G.; and McLean, Kenneth W., 4,519,188, Cl. 56-16.400.
McMahon, Donald H., to Sperry Corporation. Pressure and temperature compensated photoelastic hydrophone. 4,519,252, Cl. 73-655.000.
McMath, Jack A., to Dover Corporation. Quick connect-disconnect coupling. 4,519,635, Cl. 285-93.000.
McMillen, James M., to Mobil Oil Corporation. Combined thermal and solvent stimulation. 4,519,454, Cl. 166-303.000.
McNair, Rhett; and Helling, James, to NRG Inc. MN. Lamp apparatus. 4,520,436, Cl. 362-366.000.
Mead Corporation, The: *See*—
Cragin, Glynn P., Jr., 4,520,366, Cl. 346-1.100.
Shackleton, Craig R., 4,520,369, Cl. 346-75.000.
Meder, Willi; Bertz, Hans-Ulrich; and Golder, Peter, to Hofler, Willy. Gear probe. 4,519,141, Cl. 33-179.50R.
Medtronic, Inc.: *See*—
Cahalan, Patrick T.; Jevne, Allan H.; and Fogt, Eric J., 4,519,973, Cl. 264-267.000.
Dickhudt, Eugene A., 4,519,403, Cl. 128-785.000.
Meeker, Paul: *See*—
Bevington, John F.; Meeker, Paul; and Savidge, Michael, 4,519,112, Cl. 15-326.000.
Meidensha Electric Mfg. Co., Ltd.: *See*—
Hashimoto, Takafumi, 4,520,080, Cl. 429-18.000.
Meier, Bruno, to Sulzer Brothers Limited. Transmission having a constant torque ratio output at a variable speed ratio output. 4,519,272, Cl. 74-752.00R.
Meier, Siegfried, to SIG - Schweizerische Industrie-Gesellschaft. Apparatus for aligning and boxing flat angular items. 4,519,179, Cl. 53-236.000.
Melamed, Avraham; and Harel, Zahal. Heating system operating on stored energy. 4,519,218, Cl. 62-271.000.
Meloy, Thomas P. Casecadeograph and method of use. 4,519,244, Cl. 73-432.00R.
Mendenhall, Walter M. Shelf supporting bracket arrangement. 4,519,511, Cl. 211-187.000.
Menioux, Claude C. F.: *See*—
Loisy, Jean M.; and Menioux, Claude C. F., 4,519,208, Cl. 60-262.000.
Mennemann, Karl: *See*—
Speit, Burkhard; Mennemann, Karl; and Gliemeroth, Georg, 4,520,115, Cl. 501-60.000.
Merck & Co., Inc.: *See*—
Harris, Elbert E.; and Thorsett, Eugene D., 4,520,021, Cl. 514-212.000.
Mercury Development Corp.: *See*—
Roberts, Lewis L., 4,519,173, Cl. 52-235.000.
Merger, Franz: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.
Merichem Company: *See*—
Willis, Horace E., Jr., 4,520,002, Cl. 423-522.000.
Merrell Dow Pharmaceuticals Inc.: *See*—
Adams, Jerry L.; Metcalf, Brian W.; and Lippert, Bruce J., 4,520,028, Cl. 514-447.000.
Merrill, Duane F., to General Electric Company. Process and articles for removing typewriter inks. 4,519,720, Cl. 400-241.000.
Merry, Terri J. Diaper and method of making the same. 4,519,800, Cl. 604-385.00A.
Merten, Rudolf: *See*—
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,520,147, Cl. 524-100.000.
Mesaros, Louis: *See*—
Laviron, Charles; Lecouls, Henri; and Mesaros, Louis, 4,520,006, Cl. 423-531.000.
Metalogic, Inc.: *See*—
Johnson, Robert C., 4,519,151, Cl. 38-102.900.
Metcalf, Brian W.: *See*—
Adams, Jerry L.; Metcalf, Brian W.; and Lippert, Bruce J., 4,520,028, Cl. 514-447.000.
Metripond Merleggyar: *See*—
Koos, Rudolf, 4,520,444, Cl. 364-426.000.
Metrotech, Inc.: *See*—
Peterman, Earl J., 4,520,317, Cl. 324-326.000.
Metzeler Kautschuk GmbH: *See*—
Pfeiffer, Claus-Peter, 4,520,054, Cl. 428-35.000.
Metzger, Jean; Lecouls, Henri; Colombe , Philippe; and Wojcik, Jean. Process for producing solutions of alkali metal silicate in a static reactor. 4,520,001, Cl. 423-332.000.
Meuschke, Robert E.; Sherwood, Donald G.; and Silverblatt, Bernard L., to Westinghouse Electric Corp. Fuel transfer tube quick opening hatch. 4,519,519, Cl. 220-211.000.
Meyer, Dale L.: *See*—
Brestel, Ronald R.; and Meyer, Dale L., 4,519,579, Cl. 251-172.000.
Meyer, Thomas I.: *See*—
Riley, Robert F.; Meyer, Thomas I.; and Jordan, Wesley N., 4,519,662, Cl. 339-94.00R.
Meyer, Walter: *See*—
Hillemanns, Herbert; Samans, Robert; and Meyer, Walter, 4,520,047, Cl. 427-331.000.
Michalik, John K., to Warner-Lambert Technologies, Inc. Exposure and camera control. 4,519,692, Cl. 354-412.000.
Michel, Klaus; and Gude, Armin, to Chemische Werke Huls AG. Manufacturing dimensionally stable shaped hollow sections from aliphatic polyamides and their applications. 4,519,968, Cl. 264-178.00R.
Michel, Max: *See*—
Gresser, Robert; and Michel, Max, 4,519,933, Cl. 252-140.000.
Michigan State Univ., Board of Trustees of: *See*—
Ledebuhr, Richard L.; and Hansen, Clarence M., 4,519,191, Cl. 56-331.000.
Mick, Jon L., to FMC Corporation. Steerable carrousel supported walking beam vehicle. 4,519,468, Cl. 180-8.500.
Mieg, Christian: *See*—
Schwob, Pierre; and Mieg, Christian, 4,520,257, Cl. 219-250.000.
Mierke, Charles H.: *See*—
Long, Noel V.; and Mierke, Charles H., 4,520,430, Cl. 361-433.000.
Mifune, Hiroyuki: *See*—
Akimura, Yoshitaka; Mifune, Hiroyuki; and Nakamura, Koki, 4,520,099, Cl. 430-613.000.
Migaki, Fumihiko: *See*—
Tao, Muneo; and Migaki, Fumihiko, 4,519,775, Cl. 431-344.000.
Mikami, Takeshi: *See*—
Kakimi, Fujio; and Mikami, Takeshi, 4,520,091, Cl. 430-110.000.
Miki, Kazuyuki: *See*—
Igarashi, Kazumasa; Yamaguchi, Katsuhiko; Iko, Kazuo; and Miki, Kazuyuki, 4,520,075, Cl. 428-435.000.
Milberger, Lionel J., to FMC Corporation. Matrix switching control of subsea production systems. 4,519,263, Cl. 74-128.000.
Miller, Drew J.: *See*—
Dunmire, Robert W.; Miller, Drew J.; and Johnson, Michael D., 4,519,098, Cl. 2-161.00R.
Miller, Larry C., to DewEze Manufacturing, Inc. Grain drill suspension system. 4,519,325, Cl. 111-85.000.
Miller, Larry D. Compound archery bow. 4,519,374, Cl. 124-23.00R.
Miller, Robert C.: *See*—
O'Keefe, David B.; and Miller, Robert C., 4,520,356, Cl. 340-750.000.
Miller, Ronald L., to Research Corporation. Diagnostic method for determining content of sialic acid or sialoprotein. 4,520,111, Cl. 436-501.000.
Miller, Thomas P. Puller mechanism for assembling pipelines. 4,519,122, Cl. 29-237.000.
Milligan, Aaron. Prevention and removal of stains in pools and spas. 4,519,847, Cl. 134-28.000.
Milligan, Barton: *See*—
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,519,432, Cl. 152-357.00A.
Mills, David; Kington, Alan D.; and Lovell, Philip J., to Rolls-Royce Limited. Refractory articles and the method for the manufacture thereof. 4,520,117, Cl. 501-107.000.
Milov, Vladimir N.: *See*—
Logvinov, Anatoly A.; Milov, Vladimir N.; Ostrenko, Nikolai S.; Demyanovich, Nikolai A.; Antonov, Vladimir A.; Abdulin, Fen Z.; and Berdiev, Oleg S., 4,519,437, Cl. 164-284.000.
Milton Bradley Company: *See*—
Montlick, Terry; Skoge, Klaus; Vetter, David C.; and Ahrens, Paul R., 4,520,499, Cl. 381-36.000.
Mims, Philip B. Heating device. 4,519,378, Cl. 126-225.000.
Minakuchi, Fumio, to Aisin Seiki Kabushiki Kaisha. Auxiliary presser foot for engaging a previously formed stitch. 4,519,333, Cl. 112-311.000.
Minamikawa, Yoshihisa: *See*—
Sakitani, Yoshio; and Minamikawa, Yoshihisa, 4,520,421, Cl. 361-234.000.
Mineral Processing Systems, Inc.: *See*—
League, John S., IV, 4,520,297, Cl. 318-490.000.
Minet, Ronald G.; Dente, Mario; Ranzi, Eliseo; and Sunny H. K., to Kinetics Technology International Corp. Pyrolysis of natural gas liquids to aromatic hydrocarbons using a hot recycled gas. 4,520,217, Cl. 585-415.000.
Minick, Dale E. Peristaltic pump having variable occlusion rates. 4,519,754, Cl. 417-477.000.

Minnesota Mining and Manufacturing Company: *See—*
Foslien, Floyd L., 4,519,532, Cl. 227-8.000.
Leinen, Roger W., 4,520,142, Cl. 523-205.000.
Marentic, Frank J., 4,520,053, Cl. 428-31.000.
Piotrowski, Chester; Bendson, Steven A.; Loeding, Neil W.; and Mularie, William M., 4,520,413, Cl. 360-113.000.

Minoru, Yoshihara: *See—*
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.

Miranker, Glen S.; and Wong, Chak-Kuen, to International Business Machines Corporation. Dual reciprocating pipelined sorter. 4,520,456, Cl. 364-900.000.

Mita Industrial Company Limited: *See—*
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Satonaka, Shinobu; Kaminaga, Seiji; and Ishito, Mitsuya, 4,519,702, Cl. 355-51.000.
Umeda, Tadashi; Miyoshi, Hideo; Kishimoto, Keiichi; Iida, Kazumi; Akiyama, Kazunori; Abe, Yuji; and Taniguchi, Masato, 4,520,354, Cl. 340-679.000.

Mitani, Katsuaki: *See—*
Matsuda, Shunsuke; Mitani, Katsuaki; Yoda, Hironori; and Nishizawa, Kesaji, 4,519,763, Cl. 425-192.00R.

Mitch, John H., to Tektronix, Inc. Joystick apparatus. 4,520,355, Cl. 340-709.000.

Mitchell, Bruce R.; and Vogel, Roger F., to Gulf Research & Development Company. Vanadium passivation in a hydrocarbon catalytic cracking process. 4,520,120, Cl. 502-68.000.

Mitchell, Stewart D.; and Wheeler, Steven A., to Texaco Limited. Offshore well head protector and method of installation. 4,519,727, Cl. 405-204.000.

Mitchell, Stewart D.: *See—*
Knowles, John P.; Wheeler, Steven A.; and Mitchell, Stewart D., 4,519,726, Cl. 405-195.000.

Mitchell, William A.; Thompson, J. Brent; and Freese, John L., to Ex-Cello-O Corporation. High speed spindle with preloaded bearings. 4,519,734, Cl. 409-231.000.

Mitsubishi Chemical Industries Ltd.: *See—*
Hayashi, Masahiro; Nozawa, Seiichi; and Oikawa, Takashi, 4,520,208, Cl. 549-308.000.
Otake, Masayuki; Murayama, Masayoshi; and Kawaragi, Yuji, 4,520,127, Cl. 502-209.000.

Mitsubishi Denki Kabushiki Kaisha: *See—*
Hamano, Isao, 4,519,261, Cl. 74-7.00E.
Horikiri, Kenji; Ueda, Fumio; and Ideno, Hiroaki, 4,519,679, Cl. 350-339.00R.
Inoue, Takeo; and Shirazawa, Takashi, 4,519,970, Cl. 264-261.000.
Isozumi, Shuzoo; and Hara, Kazuyoshi, 4,520,285, Cl. 310-83.000.
Ito, Eizi, 4,520,425, Cl. 361-384.000.
Makino, Tomoaki, 4,520,358, Cl. 340-799.000.
Mashiko, Koichiro, 4,520,466, Cl. 365-210.000.
Tanahashi, Toru, 4,519,479, Cl. 187-29.00R.
Yamamoto, Katsuyoshi; Mizukami, Haruo; and Nambu, Hajime, 4,520,505, Cl. 382-55.000.
Yoshii, Toshio; and Furukawa, Shigeyoshi, 4,520,246, Cl. 200-144.00B.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See—*
Danno, Yoshiaki; Kobayashi, Hiroyuki; and Fukui, Toyoaki, 4,520,272, Cl. 290-40.00A.
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,519,273, Cl. 74-752.00A.

Mitsubishi Jukogyo Kabushiki Kaisha: *See—*
Hatano, Hirofumi; and Hirota, Yoji, 4,519,822, Cl. 55-459.00R.
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, 4,520,224, Cl. 585-648.000.

Mitsubishi Mining and Cement Co.: *See—*
Hatano, Hirofumi; and Hirota, Yoji, 4,519,822, Cl. 55-459.00R.

Mitsubishi Paper Mills, Ltd.: *See—*
Amano, Masahiro; Seino, Shunji; Nishiyama, Ryota; and Nozaki, Masaoki, 4,519,873, Cl. 162-138.000.
Matsushita, Toshihiko; and Morishita, Sadao, 4,520,378, Cl. 346-209.000.
Morishita, Sadao; and Matsushita, Toshihiko, 4,520,376, Cl. 346-204.000.
Senga, Takao; Yamada, Jun; and Suzuki, Shigeyoshi, 4,520,088, Cl. 430-49.000.
Tazuki, Shoji; and Toyama, Koji, 4,520,089, Cl. 430-49.000.

Mitsubishi Petrochemical Company Limited: *See—*
Uesugi, Kenji; Irie, Shin-ichi; Asada, Yoshihisa; Maeda, Masahiro; Yamada, Nobuyuki; and Nakagawa, Hideaki, 4,520,230, Cl. 174-107.000.

Mitsubishi Rayon Company, Ltd.: *See—*
Kamada, Kazumasa; Osaka, Norihisa; and Kaneda, Masahiro, 4,520,166, Cl. 525-85.000.

Mitsuhashi, Shigeru; Kumobayashi, Hidenori; and Akutagawa, Susumu, to Takasago Perfumery Co., Ltd. Process for producing myrcenol. 4,520,212, Cl. 568-875.000.

Mitsui Engineering and Shipbuilding Company, Ltd.: *See—*
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,519,728, Cl. 405-224.000.

Mitsui Petrochemical Industries, Ltd.: *See—*
Kawamoto, Keiji; Kato, Keigo; and Aida, Takahiro, 4,520,126, Cl. 502-184.000.

Mittmann, Bernd, to Webasto-Werk. W. Baier GmbH & Co. Heating device fed with free-flowing fuel. 4,519,772, Cl. 431-45.000.

Miura, Shuji: *See—*
Yoshida, Iwao; Kasanami, Takeo; and Miura, Shuji, 4,519,963, Cl. 264-45.300.

Miwa, Naoto: *See—*
Oyobe, Kazuo; Nomura, Etsuji; Matsui, Kazuma; Fukutani, Masanori; Ito, Kazuyuki; Miwa, Naoto; and Ito, Keiji, 4,519,820, Cl. 55-284.000.

Miyagi, Hideo: *See—*
Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, 4,519,353, Cl. 123-359.000.

Miyai, Seiichi: *See—*
Nakajima, Kaoru; and Miyai, Seiichi, 4,520,079, Cl. 428-694.000.

Miyakoshi, Shinichi; and Oyama, Kazuo, to Honda Giken Kogyo Kabushiki Kaisha. Multi-cylinder engine mounted on motorcycle. 4,519,471, Cl. 180-219.000.

Miyazaki, Yasuyuki: *See—*
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,520,443, Cl. 364-424.000.

Miyoshi, Hideo: *See—*
Umeda, Tadashi; Miyoshi, Hideo; Kishimoto, Keiichi; Iida, Kazumi; Akiyama, Kazunori; Abe, Yuji; and Taniguchi, Masato, 4,520,354, Cl. 340-679.000.

Miyoshi, Shuji; Sugihara, Takashi; Jinda, Akihito; and Hijikigawa, Masaya, to Sharp Kabushiki Kaisha. Moisture responsive element with crosslinked organic membrane and protective layering. 4,520,341, Cl. 338-35.000.

Mizrahi, Sadi: *See—*
Angevine, Philip J.; Oleck, Stephen M.; Wilson, Robert C., Jr.; and Mizrahi, Sadi, 4,519,900, Cl. 208-254.00H.

Mizukami, Haruo: *See—*
Yamamoto, Katsuyoshi; Mizukami, Haruo; and Nambu, Hajime, 4,520,505, Cl. 382-55.000.

Mizuno, Kaneyoshi; Nose, Isamu; and Iizuka, Hirosi, to Oki Electric Industry Co., Ltd. Speech recognition system. 4,520,500, Cl. 381-43.000.

Mizuno, Yukio: *See—*
Ishido, Takao, Nakao, Masasi; Honya, Takao; and Mizuno, Yukio, 4,519,424, Cl. 139-91.000.

Mizutani, Hiroshi: *See—*
Sakurai, Akira; and Mizutani, Hiroshi, 4,519,799, Cl. 604-366.000.

Mobay Chemical Corporation: *See—*
Taylor, Ronald P.; Cekoric, Mark E.; Dewhurst, John E.; and Abouzahr, Saad M., 4,519,965, Cl. 264-51.000.

Mobil Oil Corporation: *See—*
Angevine, Philip J.; Oleck, Stephen M.; Wilson, Robert C., Jr.; and Mizrahi, Sadi, 4,519,900, Cl. 208-254.00H.
Braid, Milton, 4,519,928, Cl. 252-50.000.
Herrington, F. John, 4,519,146, Cl. 34-104.000.
Hsia Chen, Catherine S., 4,520,221, Cl. 585-517.000.
McMillen, James M., 4,519,454, Cl. 166-303.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,520,215, Cl. 585-255.000.
Russell, Gordon A., 4,519,592, Cl. 269-25.000.
Sharps, Gordon V., Jr., 4,519,860, Cl. 156-161.000.

Mohr, Glenn R.: *See—*
Roth, Donald J.; Kubis, Charles S.; Walter, John; and Mohr, Glenn R., 4,519,859, Cl. 156-69.000.

Molari, Richard E., Jr., to General Electric Company. Laminar structure of polycarbonate. 4,519,154, Cl. 40-615.000.

Moloney, Kieron J., to Lucas Industries Public Limited Company. Reciprocable plunger fuel injection pump. 4,519,299, Cl. 92-129.000.

Mombelli, Paup, to I.C.B. France Industrie et Componsants du Batiment Societe Anonyme. Electronically motorized lock whose motor shaft is parallel to the longitudinal axis of the bolts. 4,519,640, Cl. 292-33.000.

Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, to Canon Kabushiki Kaisha. Finder for single lens reflex camera. 4,519,685, Cl. 354-154.000.

Mondini, Giancarlo: *See—*
Weber, Kurt; Mondini, Giancarlo; and Mandl, Gerhard, 4,519,821, Cl. 55-290.000.

Moniotte, Philippe G., to Monsanto Europe, S.A. Organic thiosulphates and thiosulphonates useful as stabilizing agents for rubber vulcanizates. 4,520,154, Cl. 524-157.000.

Monsanto Company: *See—*
Sikorski, James A.; and Hoobler, Mary A., 4,519,832, Cl. 71-87.000.
Van Eenam, Donald N., 4,520,184, Cl. 526-320.000.

Monsanto Europe, S.A.: *See—*
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Montlick, Terry; Skoge, Klaus; Vetter, David C.; and Ahrens, Paul R., to Milton Bradley Company. Combination speech synthesis and recognition apparatus. 4,520,499, Cl. 381-36.000.

Moody, Albert L., to F. C. Brown Rentals, Inc. Cup marking attachment for beverage dispensing machines. 4,519,428, Cl. 141-98.000.

Moody, Roy A.: *See—*
Caveney, Jack E.; Moody, Roy A.; Bulanda, John J.; and Wende, Russell E., 4,519,129, Cl. 29-749.000.

Moon, Frederick H., to Zenith Electronics Corporation. Low noise CATV converter. 4,520,507, Cl. 455-3.000.

Moon, Joseph C.; and Craig, Arthur T. Display device. 4,519,153, Cl. 40-591.000.

Moore, Robert E.: *See—*
Simmonds, Peter G.; and Moore, Robert E., 4,520,109, Cl. 436-56.000.

Moore, William P., to Hawkeye Chemical Company. Method of converting sewage sludge to fertilizer. 4,519,831, Cl. 71-13.000.
Moorfeed Corporation: *See*—
Cortellini, Conrad, 4,520,387, Cl. 358-90.000.
Morales, Alfredo L.; Galiasso, Roberto E.; Agudelo, Maria M.; Salazar, Jose A.; and Carrasquel, Angel R., to Intevep, S.A. Catalyst having high metal retention capacity and good stability for use in the demetallization of heavy crudes and method of preparation of same. 4,520,128, Cl. 502-210.000.
Moran, David P. J.: *See*—
Gould, Grahame; Crossley, Anthony; and Moran, David P. J., 4,520,037, Cl. 426-330.600.
Mori, Junji: *See*—
Sugahara, Kenshi; Yasuda, Kazuo; and Mori, Junji, 4,519,891, Cl. 204-418.000.
Moriguchi, Haruhiko; and Kurata, Masami, to Fuji Xerox Co., Ltd. Polychromatic image sensor. 4,520,381, Cl. 357-30.000.
Moriguchi, Kouichi: *See*—
Iwamoto, Kenji; Moriguchi, Kouichi; and Matusiro, Ryuiti, 4,519,210, Cl. 60-602.000.
Morikawa, Kenichi; Nagatomi, Kazuyuki; and Katanuma, Mitsuo, to NEC Corporation. Electronic key telephone system. 4,520,235, Cl. 179-99.0LS.
Morimitsu, Toshihiko: *See*—
Hattori, Makoto; Taguma, Akihiro; Morimitsu, Toshihiko; and Takeshita, Akira, 4,519,947, Cl. 260-371.000.
Morimoto, Akira: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,520,194, Cl. 544-22.000.
Morimoto, Satoshi: *See*—
Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, 4,520,162, Cl. 525-327.600.
Morimoto, Yoshiro: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,519,790, Cl. 474-18.000.
Morishita, Hajime; Akagi, Motoo; Hayashi, Nobuaki; Nonogaki, Saburo; Uchino, Shoichi; and Kohashi, Takahiro, to Hitachi, Ltd. Process for forming powder pattern on light exposed layer having photosensitive diazonium salts. 4,520,094, Cl. 430-144.000.
Morishita, Sadao; and Matsushita, Toshihiko, to Mitsubishi Paper Mills, Ltd. Heat-sensitive recording sheet. 4,520,376, Cl. 346-204.000.
Morishita, Sadao: *See*—
Matsushita, Toshihiko; and Morishita, Sadao, 4,520,378, Cl. 346-209.000.
Morita, Yasuyuki: *See*—
Oda, Hiroyuki; Morita, Yasuyuki; and Nagao, Akihito, 4,519,350, Cl. 123-308.000.
Moriyama, Kazuhiro: *See*—
Sano, Tetsuo; Orita, Susumu; Yamazaki, Masaya; and Moriyama, Kazuhiro, 4,519,214, Cl. 62-156.000.
Moriyama, Noboru: *See*—
Fukumoto, Yasuhisa; and Moriyama, Noboru, 4,519,920, Cl. 210-701.000.
Morley, Peter; and Little, Peter J., to U.S. Philips Corporation. Spectrophotometer having wavelength selecting structure. 4,519,706, Cl. 356-319.000.
Morrison, David A.: *See*—
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,519,689, Cl. 354-304.000.
Morrow, Robert J. P., to Spetra-Physics, Inc. Sighting cap for rotating laser beam transmitter. 4,519,705, Cl. 356-138.000.
Morton Thiokol Inc.: *See*—
Hamel, Roger G.; and Poulin, Susan B., 4,520,137, Cl. 521-79.000.
Motorola, Inc.: *See*—
Berg, Daniel T., 4,520,475, Cl. 370-24.000.
Campbell, Jules D., Jr., 4,520,347, Cl. 340-347.0DD.
Sood, Lal C., 4,520,465, Cl. 365-203.000.
Vilmur, Richard J., 4,520,474, Cl. 370-24.000.
Mott, George E.; and Levert, Frederick J., Jr., to Texaco Inc. Offshore structure incorporating a conductor deflecting system. 4,519,725, Cl. 405-195.000.
Moutonnier, Claude: *See*—
Berger, Christian; Farge, Daniel; Moutonnier, Claude; and Wolff, Gerard, 4,520,193, Cl. 544-016.000.
Moynihan, John T., to American Newspaper Publishers Association. Offset printing ink. 4,519,841, Cl. 106-27.000.
Muckley, James J.: *See*—
Lindstrom, Gerald D.; Eckhart, Clifford F.; Farthing, George A., Jr.; Muckley, James J.; and Taylor, Brian E., 4,519,322, Cl. 110-264.000.
Mukai, Takamitsu: *See*—
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Mularie, William M.: *See*—
Piotrowski, Chester; Bendson, Steven A.; Loeding, Neil W.; and Mularie, William M., 4,520,413, Cl. 360-113.000.
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Oertle, Jakob; and Mulhaupt, Bruno, 4,519,899, Cl. 208-179.000.
Mullan, Noel A.: *See*—
Newsome, Peter M.; and Mullan, Noel A., 4,520,014, Cl. 424-153.000.
Muller, Christina: *See*—
Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, 4,519,997, Cl. 423-265.000.
Muller, Hans-Jurgen; and Krines, Hans-Gebhard, to Vickers, Incorporated. Valve device, especially for die casting machines. 4,519,572, Cl. 251-29.000.
Muller, Hans K.: *See*—
Hocker, Jurgen; Muller, Hans K.; and Broich, Bruno, 4,519,939, Cl. 252-500.000.
Muller, Harald: *See*—
Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geissler, Helmut, 4,519,224, Cl. 69-30.000.
Muller, Klaus-Rainer, to Kernforschungszentrum Karlsruhe GmbH. High frequency amplifier. 4,520,293, Cl. 315-5.250.
Muller, Lothar: *See*—
Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geissler, Helmut, 4,519,224, Cl. 69-30.000.
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Mund, Heinz: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schmitz, Alfred; and Mund, Heinz, 4,519,167, Cl. 51-165.770.
Murai, Kazuo; and Hasegawa, Yutaka, to Ricoh Company, Ltd. Image density control method for electrophotography. 4,519,695, Cl. 355-14.00R.
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, to Takenaka Komuten Co., Ltd.; and Kyokuto Kaihatsu Kogyo CO., Ltd. Apparatus for horizontally casting concrete. 4,519,768, Cl. 425-456.000.
Murakami, Fumikazu, to Kabushiki Kaisha Daini Seikosha. Electrodynamic speaker. 4,520,237, Cl. 179-115.5ES.
Murakami, Hiroyasu: *See*—
Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, 4,519,685, Cl. 354-154.000.
Murakami, Kunio, to Unitika Ltd. Stretched fluorine type film and method for manufacture thereof. 4,519,969, Cl. 264-210.700.
Murakami, Terukiyo, to Nissan Motor Company, Limited. Accelerator pedal control system for automotive vehicle. 4,519,360, Cl. 123-399.000.
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Murakami, Yoshihiro; and Hosoya, Nobukazu, to Sanyo Electric Co. Ltd. Amplitude modulation circuit having stable modulation characteristics. 4,520,328, Cl. 332-31.00T.
Murakoshi, Makoto, to Fuji Photo Film Co., Ltd. Endoscope with signal transmission system and method of operating same. 4,519,391, Cl. 128-303.150.
Muranaka, Akio: *See*—
Kamiya, Tadashi; Kawasaki, Kazuhiro; and Muranaka, Akio, 4,519,099, Cl. 2-424.000.
Murase, Shigemitsu, to Unitika Limited. Finish composition for polyester fiber for rubber reinforcement. 4,520,050, Cl. 427-381.000.
Murata, Shinji: *See*—
Takeda, Hiroaki; Tanaka, Kano; and Murata, Shinji, 4,519,697, Cl. 355-14.00R.
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Murayama, Masayoshi: *See*—
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Murphy, David A.; and Spellar, Peter C., to Frick Company. Microprocessor control of compression ratio at full load in a helical screw rotary compressor responsive to compressor drive motor current. 4,519,748, Cl. 417-45.000.
Murphy, Richard D.; and Sokulsky, Marvin N., to Ford Motor Company. Adjustable mounting for steerable wheels. 4,519,626, Cl. 280-661.000.
Murtha, R. Michael. Concentrating solar beam collector. 4,519,384, Cl. 126-438.000.
Murtha, Timothy P. Hydrogenation catalyst. 4,520,129, Cl. 502-222.000.
Mussiger, Klaus: *See*—
Kannegiesser, Martin; Mussiger, Klaus; and Dreischmeier, Wilfried, 4,519,222, Cl. 68-5.00C.
Myers, Roland. Oscillator having manual and automatic frequency control. 4,520,327, Cl. 331-177.00R.
N.C.A. Co., Ltd.: *See*—
Adachi, Shoichi, 4,519,595, Cl. 270-31.000.
Naan Mechanical Works: *See*—
Gorney, Moshe; and Dinur, Eldad, 4,519,546, Cl. 239-542.000.
Nacht, Sergio: *See*—
Dines, Allen I.; Yeung, David; and Nacht, Sergio, 4,520,133, Cl. 514-568.000.
Nadherny, Rudolph E., to Ireco, Inc. Adjustable support assembly. 4,519,564, Cl. 248-58.000.
Nagai, Masaru: *See*—
Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, 4,519,691, Cl. 354-400.000.
Nagamoto, Mitsuki, to Matsushita Electric Works, Ltd.; and SDS-Elektro GmbH. M.B.B. type contact arrangement for an electromagnetic relay. 4,520,333, Cl. 335-129.000.

Nagano, Masashi, to Shimano Industrial Company Limited. Sprocket for a bicycle. 4,519,791, Cl. 474-152.000.

Nagao, Akihito: *See*—
Oda, Hiroyuki; Morita, Yasuyuki; and Nagao, Akihito, 4,519,350, Cl. 123-308.000.

Nagao, Masakazu: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Nagaoka, Mitsuru; Oda, Kazuya; and Sumida, Shizuo, to Mazda Motor Corporation. Multiple clutch transmission having gear control device. 4,519,484, Cl. 192-3.580.

Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, to Nitto Boseki Co. Ltd. Method for measuring thrombin. 4,520,100, Cl. 435-13.000.

Nagase, Hidenobu; Suzuki, Shigeru; and Shimada, Shinichi, to Honda Giken Kogyo Kabushiki Kaisha. Mounting device for fuel injection nozzles for internal combustion engines. 4,519,371, Cl. 123-470.000.

Nagatomi, Kazuyuki: *See*—
Morikawa, Kenichi; Nagatomi, Kazuyuki; and Katanuma, Mitsuo, 4,520,235, Cl. 179-99.0LS.

Naito, Takayuki: *See*—
Hoshi, Hideaki; Okumura, Jun; Naito, Takayuki; Abe, Yoshio; and Aburaki, Shimpei, 4,520,022, Cl. 514-200.000.

Nakabayashi, Norio: *See*—
Seki, Yasutomo; Akiyama, Toshio; Nakabayashi, Norio; and Iizuka, Yutaka, 4,519,686, Cl. 354-200.000.

Nakagawa, Hideaki: *See*—
Uesugi, Kenji: Irie, Shin-ichi; Asada, Yoshihisa; Maeda, Masahiro; Yamada, Nobuyuki; and Nakagawa, Hideaki, 4,520,230, Cl. 174-107.000.

Nakajima, Kaoru; and Miyai, Seiichi, to Sony Corporation. Magnetic recording medium. 4,520,079, Cl. 428-694.000.

Nakajima, Toshio: *See*—
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Nakamura, Akio: *See*—
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Nakamura, Akiyoshi: *See*—
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Nakamura, Koki: *See*—
Akimura, Yoshitaka; Mifune, Hiroyuki; and Nakamura, Koki, 4,520,099, Cl. 430-613.000.

Nakamuraya Co., Ltd.: *See*—
Ishii, Mikio; Iiyama, Kazunobu; and Yazaki, Tomoyoshi, 4,520,034, Cl. 426-96.000.

Nakane, Hiroshi: *See*—
Todokoro, Shigeru; Nakane, Hiroshi; and Maeda, Satoru, 4,520,469, Cl. 369-44.000.

Nakanishi, Kiyoshi; and Okumura, Takeshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Helically-shaped intake port of an internal combustion engine. 4,519,346, Cl. 123-188.00M.

Nakanishi, Takashi, to Kao Corporation. Method and apparatus for coating. 4,520,049, Cl. 427-356.000.

Nakanishi, Yasuo; Sakamoto, Kazunori; Ando, Giichi; and Watanabe, Teruoki, to Honda Giken Kogyo Kabushiki Kaisha. Process and apparatus for heat treatment of steel material such as of soft steel or the like. 4,519,854, Cl. 148-127.000.

Nakao, Masasi: *See*—
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Nakatsugawa, Kenji; and Itaya, Hiroshi, to Anritsu Electric Company Limited. Phase difference detector with phase inversion of one input signal when phase difference is small. 4,520,321, Cl. 328-133.000.

Nakatsuji, Tadao: *See*—
Abe, Kazunobu; and Nakatsuji, Tadao, 4,520,124, Cl. 502-159.000.

Nakayama, Kazuaki, to Pioneer Electronic Corporation. Emitter follower type SEPP circuit. 4,520,323, Cl. 330-268.000.

Nakayama, Shozo; Mukai, Takamitsu; Ohno, Makoto; and Inagaki, Mitsukane, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method of manufacturing a piston for a swash plate type compressor. 4,519,119, Cl. 29-156.50R.

Nambu, Hajime: *See*—
Yamamoto, Katsuyoshi; Mizukami, Haruo; and Nambu, Hajime, 4,520,505, Cl. 382-55.000.

Namiki, Yasuomi: *See*—
Sasaki, Akihiko; Arai, Kouji; Takashi, Takano; and Namiki, Yasuomi, 4,520,405, Cl. 360-10.300.

Namikoshi, Hajime, to Daicel Chemical Industries Ltd. Carboxyalkyl acetyl celluloses, their salts and a process for the preparation of them. 4,520,192, Cl. 536-66.000.

Nara, Seietsu, to Tokyo Shibaura Denki Kabushiki Kaisha. Sorter with automatic discharging unit. 4,520,447, Cl. 364-478.000.

Narita, Hitoshi: *See*—
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,519,728, Cl. 405-224.000.

Naruo, Kyoichi: *See*—
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Naruo, Kyoichi, and Okita, Tsutomu, 4,520,070, Cl. 428-336.000.

Naruse, Fumio, to Nippon Gakki Seizo Kabushiki Kaisha. Output jack for electric guitar. 4,519,287, Cl. 84-1.160.

National Can Corporation: *See*—
Traczyk, Edward S.; and Shulski, Michael M., 4,519,232, Cl. 72-133.000.

National Distillers and Chemical Corporation: *See*—
Schnur, Nicholas E.; and Beimesch, Bruce J., 4,519,932, Cl. 252-73.000.

National Research Development Corporation: *See*—
Hill, Roland J.; and Acarnley, Paul P., 4,520,302, Cl. 318-696.000.
Mansfield, Robert J.; Payne, David N.; and Sasaki, Issei, 4,519,704, Cl. 356-73.100.

National Semiconductor Corporation: *See*—
Jett, William B., Jr.; and Wilcox, Milton E., 4,520,324, Cl. 330-285.000.

National-Standard Company: *See*—
Oppenhuisen, Fred H.; and Allee, Frank O., 4,519,192, Cl. 56-298.000.

National Starch and Chemical Corporation: *See*—
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National Super Service Company, The: *See*—
Bevington, John F.; Meeker, Paul; and Savidge, Michael, 4,519,112, Cl. 15-326.000.

Natmar, Inc.: *See*—
Clay, Bobby J., 4,519,857, Cl. 156-64.000.

Nause, Earl E.: *See*—
De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.

Nausedas, Joseph A., to Union Carbide Corporation. Wicket bag packet. 4,519,504, Cl. 206-554.000.

Nawa, Hiroshi: *See*—
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NCR Canada Ltd - NCR Canada Ltee: *See*—
Enter, Rudolf; and Laverty, Michael P., 4,520,270, Cl. 250-560.000.

NCR Corporation: *See*—
Hallauer, John J., 4,520,464, Cl. 365-189.000.

NEC Corporation: *See*—
Ichimura, Yoshiaki; Noda, Atsuhito; Tokaichi, Tetsuro; and Umesato, Shoji, 4,519,660, Cl. 339-75.00M.
Kawai, Kiyoaki, 4,520,480, Cl. 370-100.000.
Morikawa, Kenichi; Nagatomi, Kazuyuki; and Katanuma, Mitsuo, 4,520,235, Cl. 179-99.0LS.

Nees, Friedbert: *See*—
Baer, Karl; Bassler, Peter; Duembgen, Gerd; Fouquet, Gerd; Krabetz, Richard; Merger, Franz; and Nees, Friedbert, 4,520,125, Cl. 502-170.000.

Nelle, Gunther, to Dr. Johannes Heidenhain GmbH. Photoelectric incremental length or angle measuring device. 4,519,709, Cl. 356-373.000.

Nelson, Thomas A., to Hadady Corporation. Brake lever retaining bracket. 4,519,480, Cl. 188-52.000.

Nemoto, Shigeru: *See*—
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Neptune Research, Inc.: *See*—
Lazzara, Richard J., 4,519,856, Cl. 156-49.000.

Nestec, S.A.: *See*—
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Neuendorf, Cristoph: *See*—
Spittka, Horst; Eckardt, Rudolf; and Neuendorf, Cristoph, 4,519,829, Cl. 65-114.000.

Neumann, Eberhard H., to American Hoechst Corporation. Method of manufacture of plastic article possessing a wet appearance. 4,519,975, Cl. 264-526.000.

Neuzil, Richard W.: *See*—
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,519,952, Cl. 260-419.000.

Nevamar Corporation: *See*—
Ungar, Israel S.; Scher, Herbert I.; and O'Neill, Nelson L., 4,520,062, Cl. 428-148.000.

Nevens, Charles J.: *See*—
Hitchcock, James R., Jr.; and Nevens, Charles J., 4,519,795, Cl. 604-289.000.

Neville, David M., Jr.; and Youle, Richard J., to United States of America, Health and Human Services. Inactivating protein synthesis by incubating anti-Thy 1.1-ricin a chain monoclonal antibody hybrids with target protein cells. 4,520,011, Cl. 424-85.000.

Neville, David M., Jr.; and Youle, Richard J., to United States of America, Health and Human Services. Treatment of graft versus host disease using a mixture of T-lymphocyte specific monoclonal antibody: ricin conjugates. 4,520,226, Cl. 424-85.000.

Newman, Arnold. Plastic bobbin. 4,519,557, Cl. 242-118.310.

Newman, Jonathan G.: *See*—
Dufour, Charles H.; and Newman, Jonathan G., 4,520,454, Cl. 364-900.000.

Newsome, Peter M.; and Mullan, Noel A., to Beecham Group p.l.c. Treatment of diarrhoea. 4,520,014, Cl. 424-153.000.

Nezat, Jerry W., to Creative Research and Development, Inc. Topical preparation and method for using same in treating skin disorders in animals. 4,520,013, Cl. 424-141.000.

NGK Insulators, Ltd.: *See*—
Matsuzawa, Soichiro; and Mase, Syunzo, 4,519,870, Cl. 156-603.000.

Niagara Blower Company: *See*—
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Nicholls, Lawrence G., to Lucas Industries Limited. Suspension strut for vehicles. 4,519,481, Cl. 188-322.170.
Nichols, Randy P., to FMC Corporation. Subsea well casing tieback connector. 4,519,633, Cl. 285-3.000.
Nickson Industries, Inc.: *See*—
Florian, Roy S., 4,519,639, Cl. 285-415.000.
Niigata Engineering Co., Ltd.: *See*—
Takahashi, Susumu, 4,519,411, Cl. 137-68.00R.
Nilsson, Karl I., to Klintland. Device for collecting solid or fluid waste. 4,519,104, Cl. 4-484.000.
Nilsson, Sten E.; and Elfverson, Sven E., to Saab-Scania Aktiebolag. Arrangement for distributing ventilation air in vehicles. 4,519,302, Cl. 98-2.080.
Nippon Electric Co., Ltd.: *See*—
Okumura, Kohichiro, 4,520,463, Cl. 365-189.000.
Sekiguchi, Toru; and Sanguu, Isao, 4,520,410, Cl. 360-77.000.
Takahashi, Hiroshi, 4,520,398, Cl. 358-183.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
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Nippon Kogaku K.K.: *See*—
Hagyuda, Nobuyoshi; Hasegawa, Hiroshi; Iida, Yoshikazu; and Maida, Osamu, 4,519,683, Cl. 354-127.110.
Seki, Yasutomo; Akiyama, Toshio; Nakabayashi, Norio; and Iizuka, Yutaka, 4,519,686, Cl. 354-200.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Hara, Tomihiro; Adaniya, Takeshi; and Tonouchi, Akira, 4,519,878, Cl. 204-28.000.
Nippon Oil Co. Ltd.: *See*—
Sakata, Ko; and Imai, Hirosuke, 4,520,178, Cl. 526-200.000.
Nippon Seiko Kabushiki Kaisha: *See*—
Tukamoto, Masahiro, 4,519,555, Cl. 242-107.200.
Nippon Soken, Inc.: *See*—
Iwamoto, Kenji; Moriguchi, Kouichi; and Matusiro, Ryuiti, 4,519,210, Cl. 60-602.000.
Kitagawa, Junji; Akita, Shigeyuki; and Kitamura, Sotoo, 4,520,359, Cl. 340-870.190.
Nippondenso Co., Ltd.: *See*—
Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.
Ariyoshi, Hiromi; and Yokomori, Iwao, 4,520,420, Cl. 361-154.000.
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Nishijima, Takayoshi: *See*—
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Maruyama, Ryoichi; Nishijima, Takayoshi; Aida, Hideaki; Konishi, Hideyuki; and Hatayama, Keiji, 4,519,275, Cl. 74-866.000.
Nishikawa, Yasuo: *See*—
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Nishimura, Yoshichika: *See*—
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Nishina, Shuho: *See*—
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Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Iketani, Yukiyoshi, to Matsushita Electric Industrial Co., Ltd. Carbonaceous solid fuel. 4,519,807, Cl. 44-15.00R.
Nishiyama, Ryota: *See*—
Amano, Masahiro; Seino, Shunji; Nishiyama, Ryota; and Nozaki, Masaoki, 4,519,873, Cl. 162-138.000.
Nishiyama, Shinichi: *See*—
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Nishizawa, Kesaji: *See*—
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Nissan Motor Company, Limited: *See*—
Ishido, Takao; Nakao, Masasi; Honya, Takao; and Mizuno, Yukio, 4,519,424, Cl. 139-91.000.
Kamijo, Ken, 4,519,652, Cl. 297-477.000.
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Matsuda, Shunsuke; Mitani, Katsuaki; Yoda, Hironori; and Nishizawa, Kesaji, 4,519,763, Cl. 425-192.00R.
Nisshin Steel Co., Ltd.: *See*—
Ono, Yoshio; and Tanaka, Takashi, 4,519,337, Cl. 118-33.000.
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Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, 4,520,100, Cl. 435-13.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Igarashi, Kazumasa; Yamaguchi, Katsuhiko; Iko, Kazuo; and Miki, Kazuyuki, 4,520,075, Cl. 428-435.000.
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Ichimura, Yoshiaki; Noda, Atsuhito; Tokaichi, Tetsuro; and Umesato, Shoji, 4,519,660, Cl. 339-75.00M.
Noda, Yuzuru; and Nakajima, Toshio, to Nitto Electric Industrial Co., Ltd. Spherical porous polyimide powder. 4,520,071, Cl. 428-402.000.
Nogami, Takahiro: *See*—
Hayashi, Kunihisa; and Nogami, Takahiro, 4,519,469, Cl. 180-169.000.
Nolan, Robert L., to Maxcap, Inc. Molding. 4,519,569, Cl. 249-142.000.
Nolff, Robert L., to Propane Carburetion Company, Inc. Bracket for supporting low pressure gas carburetor and components. 4,519,347, Cl. 123-195.00A.
Nomura, Etsuji: *See*—
Oyobe, Kazuo; Nomura, Etsuji; Matsui, Kazuma; Fukutani, Masanori; Ito, Kazuyuki; Miwa, Naoto; and Ito, Keiji, 4,519,820, Cl. 55-284.000.
Nomura, Isshi, to Aisin Seiki Kabushiki Kaisha. Carburetor. 4,519,367, Cl. 123-440.000.
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, to Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. Process for manufacturing a cartridge for purifying exhaust gas. 4,519,120, Cl. 29-157.00R.
Nonogaki, Saburo: *See*—
Morishita, Hajime; Akagi, Motoo; Hayashi, Nobuaki; Nonogaki, Saburo; Uchino, Shoichi; and Kohashi, Takahiro, 4,520,094, Cl. 430-144.000.
Nordica S.p.A.: *See*—
Pozzobon, Alessandro, 4,519,149, Cl. 36-121.000.
Norell, Ronald A., to Burroughs Corporation. Machine for filling via holes in an integrated circuit package with conductive ink. 4,519,760, Cl. 425-113.000.
Noren, Gerry K.; and Clifton, Mary F., to DeSoto, Inc. Polydimethylsiloxane-modified polyepoxides. 4,520,144, Cl. 523-435.000.
Norlin Industries, Inc.: *See*—
Hall, Robert J.; Hall, George R.; and Cookerly, Jack C., 4,519,286, Cl. 84-1.030.
Norris, Michael A., to United Kingdom Atomic Energy Authority. Tube-in-shell heat exchangers. 4,519,445, Cl. 165-76.000.
Norton Christensen, Inc.: *See*—
Roper, Rudolf, 4,519,574, Cl. 251-31.000.
Norton, Peter. Amplifier power stage. 4,520,438, Cl. 363-98.000.
Nose, Isamu: *See*—
Mizuno, Kaneyoshi; Nose, Isamu; and Iizuka, Hirosi, 4,520,500, Cl. 381-43.000.
Novo Industri A/S: *See*—
Eilertsen, Jens H.; Fog, Arne D.; and Gibson, Keith, 4,519,934, Cl. 252-174.120.
Nozaki, Masaoki: *See*—
Amano, Masahiro; Seino, Shunji; Nishiyama, Ryota; and Nozaki, Masaoki, 4,519,873, Cl. 162-138.000.
Nozawa, Seiichi: *See*—
Hayashi, Masahiro; Nozawa, Seiichi; and Oikawa, Takashi, 4,520,208, Cl. 549-308.000.
NRG Inc. MN: *See*—
McNair, Rhett; and Helling, James, 4,520,436, Cl. 362-366.000.
Nu-Bar Electronics: *See*—
Gauthier, Edouard A., 4,520,236, Cl. 179-107.00E.
Nubson, Richard C.: *See*—
Warwick, Dennis J.; Nubson, Richard C.; and Howes, Ronald B., Jr., 4,519,600, Cl. 271-4.000.
O. Kytola ja Kumpp. Kommandiittiyhtio : *See*—
Horttonen, Kalevi, 4,519,247, Cl. 73-198.000.
Obara, Haruki: *See*—
Gamo, Gotaro; Kinoshita, Mitsuo; and Obara, Haruki, 4,520,253, Cl. 217-69.00W.
O'Boyle, Dolores; and Shonk, Phyllis, to International Playtex, Inc. Brassiere. 4,519,137, Cl. 33-17.00R.
O'Brien, Joseph P.; and Papay, Andrew G., to Edwin Cooper, Inc. Lubricating oil composition containing N-allyl amide graft copolymers. 4,519,929, Cl. 252-51.50A.
Ochiai, Hideo; Hamane, Masumi; and Kimoto, Masahiko, to Honda Giken Kogyo Kabushiki Kaisha. Cooling system for a motorcycle. 4,519,473, Cl. 180-229.000.
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. Cephalosporins. 4,520,194, Cl. 544-22.000.
Ochsner, Rolf H., to Robertshaw Controls Company. Differential pressure operated electrical switch construction. 4,520,245, Cl. 200-82.00R.
Oda, Hiroyuki; Morita, Yasuyuki; and Nagao, Akihito, to Mazda Motor Corporation. Intake system for an internal combustion engine. 4,519,350, Cl. 123-308.000.
Oda, Kazuya: *See*—
Nagaoka, Mitsuru; Oda, Kazuya; and Sumida, Shizuo, 4,519,484, Cl. 192-3.580.
Oda, Masatoshi, to Nissan Motor Co., Ltd. Gear shift apparatus for manual transmission. 4,519,268, Cl. 74-473.00P.
O'Donnell, Timothy W.; and Olson, Daniel R., to General Electric Company. Polymerizable 3-aroyloxyphenyl carbamates and methods for their preparation and use. 4,520,074, Cl. 428-412.000.
Oertle, Jakob; and Mulhaupt, Bruno, to Sulzer-Escher Wyss Ltd. Purification of oil using a jet pump mixer. 4,519,899, Cl. 208-179.000.
Oettinger, Peter E.: *See*—
Lee, Chung H.; Fronduto, John; and Oettinger, Peter E., 4,519,876, Cl. 204-15.000.

Ogata, Hajime: *See*—
Ichida, Toshio; Kobayashi, Hideo; Ogata, Hajime; and Tsugawa, Shunichi, 4,519,879, Cl. 204-35.100.

Oguchi, Kiyoshi. Negative-type resist sensitive to ionizing radiation. 4,520,097, Cl. 430-280.000.

Ohashi, Shinichi: *See*—
Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, 4,520,162, Cl. 525-327.600.

Ohata, Hiroyoshi: *See*—
Yodoshi, Tatsuo; Ohata, Hiroyoshi; and Inoue, Hiroshi, 4,519,638, Cl. 285-305.000.

Ohba, Hiroshi; and Horino, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet packet discharging apparatus. 4,519,523, Cl. 221-129.000.

Ohba, Masatoshi: *See*—
Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,520,289, Cl. 310-316.000.

Ohde, Hironori: *See*—
Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,520,201, Cl. 548-342.000.

Ohkawa, Shuji: *See*—
Ishihara, Masahiro; Watanabe, Mitsuru; Ohkawa, Shuji; Taguchi, Shunichi; and Kikuchi, Itsuo, 4,520,250, Cl. 219-10.55B.

Ohkubo, Yuichi: *See*—
Watanabe, Kazuo; Ohkubo, Yuichi; Haeno, Akira; and Yokogawa, Fumihiko, 4,520,282, Cl. 307-491.000.

Ohno, Makoto: *See*—
Nakayama, Shozo; Mukai, Takamitsu; Ohno, Makoto; and Inagaki, Mitsukane, 4,519,119, Cl. 29-156.50R.

Ohshima, Eiji, to Sony Corporation. Magnetic tape recording device. 4,520,411, Cl. 360-85.000.

Ohsima, Ken: *See*—
Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, 4,520,280, Cl. 307-358.000.

Ohtani, Shinzi: *See*—
Kutsuna, Tomoharu; Ohtani, Shinzi; and Kondo, Kunimasa, 4,520,045, Cl. 427-294.000.

Ohyama, Hideo: *See*—
Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.

Ohyama, Kazuo; and Kitami, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. V-type internal combustion engine. 4,519,344, Cl. 123-55.0VF.

Oi, Vernon T.: *See*—
Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., 4,520,110, Cl. 436-501.000.

Oikawa, Takashi: *See*—
Hayashi, Masahiro; Nozawa, Seiichi; and Oikawa, Takashi, 4,520,208, Cl. 549-308.000.

Okabe, Akira; Urushidani, Haruo; and Kashiwahara, Katsuto, to Hitachi, Ltd. Combined plant having steam turbine and gas turbine connected by single shaft. 4,519,207, Cl. 60-39.182.

Okabe, Yoshiro. Method for producing leather fibrous tissues planted on a basic clothing sheet and sheet products produced thereby. 4,520,058, Cl. 428-90.000.

Okada, Isoji: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Okamoto & Co., Ltd.: *See*—
Hirano, Hideo, 4,519,221, Cl. 66-107.000.

Okamoto, Miyoshi: *See*—
Kato, Hiroyasu; Yagi, Kenkichi; and Okamoto, Miyoshi, 4,519,804, Cl. 8-485.000.

Okamoto, Norifumi, to Okamoto Seiki Kogyo Kabushiki Kaisha. Chuck for a machine tool. 4,519,621, Cl. 279-116.000.

Okamoto Seiki Kogyo Kabushiki Kaisha: *See*—
Okamoto, Norifumi, 4,519,621, Cl. 279-116.000.

Okamoto, Toshiro: *See*—
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, 4,520,224, Cl. 585-648.000.

O'Keefe, David B.; and Miller, Robert C., to Honeywell Information Systems Inc. Display video generation system for modifying the display of character information as a function of video attributes. 4,520,356, Cl. 340-750.000.

Oki Electric Industry Co., Ltd.: *See*—
Mizuno, Kaneyoshi; Nose, Isamu; and Iizuka, Hirosi, 4,520,500, Cl. 381-43.000.

Okigawa, Etsumi: *See*—
Tanaka, Osamu; Iijima, Hiroshi; Ito, Masayoshi; and Okigawa, Etsumi, 4,519,649, Cl. 297-316.000.

Okita, Tsutomu: *See*—
Yamamoto, Nobuyuki; Nishikawa, Yasuo; Naruo, Kyoichi; and Okita, Tsutomu, 4,520,070, Cl. 428-336.000.

Oku, Narihiro: *See*—
Uematsu, Hiroaki; Aoki, Junji; and Oku, Narihiro, 4,519,890, Cl. 204-409.000.

Okumura, Jun: *See*—
Hoshi, Hideaki; Okumura, Jun; Naito, Takayuki; Abe, Yoshio; and Aburaki, Shimpei, 4,520,022, Cl. 514-200.000.

Okumura, Kohichiro, to Nippon Electric Co., Ltd. Memory circuit. 4,520,463, Cl. 365-189.000.

Okumura, Takeo: *See*—
Ando, Hiroshi; and Okumura, Takeo, 4,520,008, Cl. 424-47.000.

Okumura, Takeshi: *See*—
Nakanishi, Kiyoshi; and Okumura, Takeshi, 4,519,346, Cl. 123-188.00M.

Okuyama, Shigeaki: *See*—
Yoshida, Jituo; Okuyama, Shigeaki; and Suzuki, Hiroshi, 4,519,193, Cl. 56-328.00R.

Olapinski, Hans: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,519,359, Cl. 123-668.000.

Olas, Richard J., to KoMac Enterprises, Inc. Magnetic disc storage container. 4,519,893, Cl. 206-311.000.

Oleck, Stephen M.: *See*—
Angevine, Philip J.; Oleck, Stephen M.; Wilson, Robert C., Jr.; and Mizrahi, Sadi, 4,519,900, Cl. 208-254.00H.

Oliveau, Olivier; and Blanc, Claude, to Societe Nationale Elf Anquitaine. Enrichment in hydrogen sulphide of gases containing it. 4,519,991, Cl. 423-220.000.

Olson, Archie H.: *See*—
Johnson, Warren K.; Goettsch, Michael R.; and Olson, Archie H., 4,519,714, Cl. 366-285.000.

Olson, Daniel R.: *See*—
O'Donnell, Timothy W.; and Olson, Daniel R., 4,520,074, Cl. 428-412.000.

Olympus Optical Co. Ltd.: *See*—
Kobayashi, Minoru; and Nemoto, Shigeru, 4,520,415, Cl. 360-137.000.
Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, 4,520,280, Cl. 307-358.000.

Omco Inc.: *See*—
Simmler, Lawrence W.; and Carlson, John H., 4,519,225, Cl. 70-34.000.

Omi, Junji: *See*—
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, 4,520,340, Cl. 338-195.000.

Omichi, Namio. Packing and displaying carton, and blank plate therefor. 4,519,538, Cl. 229-27.000.

Omnicom Engineering: *See*—
Smith, James W., 4,520,233, Cl. 179-1.50R.

Omron Tateisi Electronics Co.: *See*—
Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,520,289, Cl. 310-316.000.

O'Neil, Michael A.: *See*—
Tomlin, Jerry B.; Levey, Gustave S.; and O'Neil, Michael A., 4,519,636, Cl. 285-95.000.

O'Neill, Nelson L.: *See*—
Ungar, Israel S.; Scher, Herbert I.; and O'Neill, Nelson L., 4,520,062, Cl. 428-148.000.

Ono, Motoji; Hirao, Masao; and Fukushima, Shigehisa, to Kirin Beer Kabushiki Kaisha. Device for recovering contents in containers such as beer bottles. 4,519,427, Cl. 141-65.000.

Ono, Yoshio; and Tanaka, Takashi, to Nisshin Steel Co., Ltd. Apparatus for continuous hot dipping of metal strip. 4,519,337, Cl. 118-33.000.

Onozawa, Kazuyoshi: *See*—
Yokoe, Sadao; Abe, Seimei; Wakata, Shoichi; Endou, Satosi; and Onozawa, Kazuyoshi, 4,519,549, Cl. 239-703.000.

Oppelt, Arnulf: *See*—
Loeffler, Wilfried; Oppelt, Arnulf; and Siebold, Horst, 4,520,315, Cl. 324-309.000.

Oppenhuisen, Fred H.; and Allee, Frank O., to National-Standard Company. Hold-down sickle guard. 4,519,192, Cl. 56-298.000.

Orbital Engine Company Proprietary Limited: *See*—
Sarich, Tony R., 4,519,356, Cl. 123-533.000.

Orita, Susumu: *See*—
Sano, Tetsuo; Orita, Susumu; Yamazaki, Masaya; and Moriyama, Kazuhiro, 4,519,214, Cl. 62-156.000.

ORMIG S.p.A.: *See*—
Testore, Guido, 4,519,741, Cl. 414-738.000.

Oronzio de Nora, S.A.: *See*—
de Nora, Oronzio; and Bianchi, Giuseppe, 4,519,886, Cl. 204-196.000.

Oronzio deNora Impianti Elettrochimici S.p.A.: *See*—
Pellegri, Alberto; and Spaziante, Placido M., 4,519,889, Cl. 204-275.000.

Orsborn, Jesse H.: *See*—
Fachini, Robert M.; Orsborn, Jesse H.; and Barrett, Monroe C., 4,519,189, Cl. 56-16.600.

Orthman, Henry K., to Orthman Manufacturing, Inc. Tractor front end hitch. 4,519,623, Cl. 280-461.00A.

Orthman Manufacturing, Inc.: *See*—
Orthman, Henry K., 4,519,623, Cl. 280-461.00A.

Orthopedic Equipment Co. Inc.: *See*—
Wills, Robert P.; and Brooker, Andrew F., 4,519,100, Cl. 3-1.900.

Orton, Gregory A.: *See*—
Latimer, Stanley M.; and Orton, Gregory A., 4,520,414, Cl. 360-125.000.

Osaka, Norihisa: *See*—
Kamada, Kazumasa; Osaka, Norihisa; and Kaneda, Masahiro, 4,520,166, Cl. 525-85.000.
Osaka Oxygen Industries Ltd.: *See*—
Hagiwara, Zenzi; Yamamoto, Tatuo; and Kurozumi, Hiroshi, 4,519,813, Cl. 55-26.000.
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, to Mitsui Engineering and Shipbuilding Company, Ltd. Floating offshore structure. 4,519,728, Cl. 405-224.000.
Oshima, Michio: *See*—
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, 4,520,224, Cl. 585-648.000.
Oshima, Noboru: *See*—
Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,519,431, Cl. 152-209.00R.
Osterreichische Draukraftwerke Aktiengesellschaft: *See*—
Schrofelbauer, Herbert; and Staudinger, Gernot, 4,519,995, Cl. 423-244.000.
Ostrenko, Nikolai S.: *See*—
Logvinov, Anatoly A.; Milov, Vladimir N.; Ostrenko, Nikolai S.; Demyanovich, Nikolai A.; Antonov, Vladimir A.; Abdulin, Fen Z.; and Berdiev, Oleg S., 4,519,437, Cl. 164-284.000.
Otake, Masayuki; Murayama, Masayoshi; and Kawaragi, Yuji, to Mitsubishi Chemical Industries Ltd. Oxidation catalyst composition. 4,520,127, Cl. 502-209.000.
Otis Engineering Corporation: *See*—
Gray, Floyd R.; and Rood, Dennis D., 4,519,451, Cl. 166-278.000.
Ott, Karl-Heinz: *See*—
Zabrocki, Karl; Ott, Karl-Heinz; Schmidt, Adolf; and Pischtschan, Alfred, 4,520,165, Cl. 525-84.000.
Ott, William E.; and Krieg, Edwin A., to Allied Corporation. Wedge actuated drum brake assembly. 4,519,482, Cl. 188-343.000.
Ottenhof, Henricus A. W. E. M., to Stichting Nederlands Instituut Voor Zuivelonderzoek. Process for the preparation of a precipitate of casein and whey protein. 4,519,945, Cl. 260-119.000.
Ou, Di-Yi, to UOP Inc. Separation of sucrose from molasses. 4,519,845, Cl. 127-46.200.
Outboard Marine Corporation: *See*—
McAuliffe, Robert E., 4,520,353, Cl. 340-636.000.
Outokumpu Oy: *See*—
Sipila , Heikki; Kiuru, Erkki; and Vaijarvi, Seppo, 4,520,267, Cl. 250-358.100.
Ovshinsky, Stanford R., to Sovonics Solar Systems. Compositionally varied materials and method for synthesizing the materials. 4,520,039, Cl. 427-35.000.
Ovshinsky, Stanford R.; and Madan, Arun, to Sovonics Solar Systems. Amorphous semiconductors equivalent to crystalline semiconductors. 4,520,380, Cl. 357-2.000.
Ovshinsky, Stanford R.: *See*—
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,519,339, Cl. 118-718.000.
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., to Mobil Oil Corporation. Catalytic conversion of olefinic Fischer-Tropsch light oil to heavier hydrocarbons. 4,520,215, Cl. 585-255.000.
Owens-Illinois, Inc.: *See*—
Amos, Charles W., 4,519,516, Cl. 215-252.000.
Uhlig, Albert R., 4,519,976, Cl. 264-540.000.
Oyama, Kazuo: *See*—
Miyakoshi, Shinichi; and Oyama, Kazuo, 4,519,471, Cl. 180-219.000.
Oyobe, Kazuo; Nomura, Etsuji; Matsui, Kazuma; Fukutani, Masanori; Ito, Kazuyuki; Miwa, Naoto; and Ito, Keiji, to Nippondenso Co., Ltd. Fitter apparatus for purifying exhaust gases. 4,519,820, Cl. 55-284.000.
Ozawa, Minoru: *See*—
Suzuki, Toshinori; and Ozawa, Minoru, 4,520,406, Cl. 360-14.200.
Ozeki, Mineo: *See*—
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,520,443, Cl. 364-424.000.
Paccar Inc.: *See*—
Saunders, James W., 4,519,467, Cl. 180-68.400.
Page, Frank C., III: *See*—
Wiles, Laurence E.; and Page, Frank C., III, 4,519,518, Cl. 215-331.000.
Pagels, Louis T.: *See*—
Weiler, Gerhard H.; and Pagels, Louis T., 4,519,513, Cl. 215-32.000.
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., to Stauffer Chemical Co. Herbicide compositions. 4,519,833, Cl. 71-100.000.
Palm, Bengt N. J.: *See*—
Dworak, Ulf; Olapinski, Hans; Fingerle, Dieter; Krohn, Ulrich; Hakulinen, Martti J. A.; and Palm, Bengt N. J., 4,519,359, Cl. 123-668.000.
Palus, Wilfried: *See*—
Schmitt, Hans-Georg; Palus, Wilfried; and Genth, Hermann, 4,520,023, Cl. 514-241.000.
Pancook, James J.; and Ulbing, Otmar M., to Columbus McKinnon Corporation. Pendant type electrical switching device. 4,520,247, Cl. 200-298.000.
Pando, Bernard: *See*—
Grima, Jean-Claude; Pando, Bernard; and David, Guy A. J., 4,520,479, Cl. 370-84.000.
Panduit Corp.: *See*—
Caveney, Jack E.; Moody, Roy A.; Bulanda, John J.; and Wende, Russell E., 4,519,129, Cl. 29-749.000.
Panique, Kenneth: *See*—
Buckley, Galen L.; and Panique, Kenneth, 4,519,674, Cl. 350-102.000.
Pansanel, Jean C., to AMP Incorporated. Method of, and apparatus for, terminating a conductor of a flat flexible cable. 4,519,133, Cl. 29-863.000.
Papay, Andrew G.: *See*—
O'Brien, Joseph P.; and Papay, Andrew G., 4,519,929, Cl. 252-51.50A.
Paper Converting Machine Company: *See*—
Johnson, Gary E.; and Van Egeren, Andrew M., 4,519,596, Cl. 270-32.000.
Papir, Yoram S., to Chevron Research Company. Electroactive polymers. 4,519,937, Cl. 252-500.000.
Papir, Yoram S., to Chevron Research Company. Electroactive polymers. 4,519,938, Cl. 252-500.000.
Papp nee Behr, Agnes: *See*—
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.
Papyrus Kopparfors AB: *See*—
Ericsson, Thomas; Gylfe, Sten; and Hedblom, Mats-Olov, 4,519,918, Cl. 210-680.000.
Paredes, Candelario; and Stevens, William D., to Forney Engineering Company. Burner monitoring system. 4,520,390, Cl. 358-108.000.
Parekh, Girish G.: *See*—
Blank, Werner J.; and Parekh, Girish G., 4,520,167, Cl. 525-131.000.
Parikh, Kamal I.: *See*—
Simmons, Nathaniel; Puccini, Sergio E.; Magnusson, Stig E.; and Parikh, Kamal I., 4,520,478, Cl. 370-63.000.
Parish, Mark G.; and Rulseh, Roy M., to Aqua-Chem, Inc. Dual cannister gas housing. 4,519,773, Cl. 431-176.000.
Parker, Eli H. Blade height calibration device. 4,519,142, Cl. 33-185.00R.
Parkinson, Dean B.; and Bergren, Orton D., to Computer Identification Systems, Inc. Identification card with heat reactive coating. 4,519,632, Cl. 283-75.000.
Parma Corporation: *See*—
Rogers, Walter C., Jr., 4,519,647, Cl. 297-85.000.
Parody, Ross. Method and means of bagging loose trash. 4,519,183, Cl. 53-461.000.
Paschke, Werner: *See*—
Kubach, Hans; Kienzle, Wolfgang; Paschke, Werner; and Sauer, Rudolf, 4,519,547, Cl. 239-585.000.
Pastor, Ricardo C.; and Chew, Remedios K., to Hughes Aircraft Company. Process for preparation of ultrapure thorium fluoride. 4,519,986, Cl. 423-19.000.
Paul Associates, Inc.: *See*—
Paul, Stanley M., 4,519,581, Cl. 251-268.000.
Paul, Stanley M., to Paul Associates, Inc. Faucet handle. 4,519,581, Cl. 251-268.000.
Paulet, Jacques: *See*—
Espitalie, Jean; Madec, Marcel; Leplat, Paul; and Paulet, Jacques, 4,519,983, Cl. 422-78.000.
Pautz, Anton: *See*—
Spinner, Georg; Lang, Manfred; and Pautz, Anton, 4,519,670, Cl. 350-96.150.
Payne, David N.: *See*—
Mansfield, Robert J.; Payne, David N.; and Sasaki, Issei, 4,519,704, Cl. 356-73.100.
Pearce, Jeffrey B.: *See*—
Chan, Luen C.; Beckwith, Paul B.; and Pearce, Jeffrey B., 4,520,506, Cl. 382-56.000.
Pearson, Alan; and The, Paul J., to Aluminum Company of America. Removal of organic contaminants from bauxite and other ores. 4,519,989, Cl. 423-121.000.
Peash, Douglas E.: *See*—
Carpenter, Paul E.; Fisher, Charles B.; and Peash, Douglas E., 4,520,424, Cl. 361-383.000.
Peckels, Jean; and Schaaf, Antoine, to Arbed S.A. Apparatus for regulating the delivery of solid materials by a blowing lance. 4,519,587, Cl. 266-80.000.
Peiffer, Dennis G.; Lundberg, Robert D.; Duvdevani, Ilan; and Thaler, Warren A., to Exxon Research & Engineering Co. Nonaqueous solvent soluble polyampholytes-viscosifier and shear thickening additive. 4,520,158, Cl. 524-481.000.
Pellegri, Alberto; and Spaziante, Placido M., to Oronzio deNora Impianti Elettrochimici S.p.A. Halogenation apparatus. 4,519,889, Cl. 204-275.000.
Penn-Med Technology, Inc.: *See*—
Lieb, Nathaniel H., 4,519,779, Cl. 433-18.000.
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Kinsolving, C. Richard, 4,520,132, Cl. 514-560.000.
Pentek Corporation: *See*—
Dyer, Thomas A., 4,519,493, Cl. 198-414.000.
Perchak, William C., to Plastofilm Industries, Inc. Display/storage package and file therefor. 4,519,500, Cl. 206-312.000.
Perlegos, George: *See*—
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,519,849, Cl. 148-1.500.
Perlmutter, Michael S.; and Braun, Kenneth H., to Raytheon Company. Mode discrimination apparatus. 4,519,708, Cl. 356-350.000.
PermaGrain Products, Inc.: *See*—
Witt, Alvin E., 4,519,174, Cl. 52-389.000.

Perry, Charles H.; and Shaw, Robert R., to International Business Machines Corporation. Method for providing pinhole free dielectric layers. 4,519,851, Cl. 148-6.310.
Perry, E. Robert: *See—*
Rabinowitz, Mario; and Perry, E. Robert, 4,520,078, Cl. 428-636.000.
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Perry, Wendell L.: *See—*
Buonomo, Joseph P.; and Perry, Wendell L., 4,520,440, Cl. 364-200.000.
Persson, Jan O.: *See—*
Skowronek, Jerzy; and Persson, Jan O., 4,520,052, Cl. 427-443.100.
Pesa, Fred A.: *See—*
Burrington, James D.; Pesa, Fred A.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,519,954, Cl. 260-465.80D.
Pesche, Bernard. Method for manufacturing a product for destroying harmful animals. 4,520,015, Cl. 424-153.000.
Pestel, Karl: *See—*
Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geissler, Helmut, 4,519,224, Cl. 69-30.000.
Peterman, Earl J., to Metrotech, Inc. Apparatus including a pair of automatic gain controlled amplifiers for determining the lateral direction to a concealed conductive object. 4,520,317, Cl. 324-326.000.
Petermann, Harald; and Loesch, Karl G., to Georg Muller Kugellagen Fabrik K.G. Workpiece handling apparatus for grinding machines. 4,519,166, Cl. 51-103.0WH.
Petersson, Stig A.; and Waara, Ulf C., to Boliden Aktiebolag. Method of manufacturing sulphur-trioxide for the production of sulphuric acid. 4,520,003, Cl. 423-533.000.
Petr, Jan; and Steinle, Benedikt, to LGZ Landis & Gyr Zug AG. Current to pulse-sequence transducer. 4,520,311, Cl. 324-117.00R.
Petrie, Harold L.: *See—*
Holland, Ronald A.; Petrie, Harold L.; Brennan, John R.; and Christ, Frederick C., 4,519,457, Cl. 166-317.000.
Petrille, Dennis G.: *See—*
Basalay, Robert J.; West, C. Thomas; and Petrille, Dennis G., 4,519,926, Cl. 252-49.600.
Petro, John D., to Commercial Shearing, Inc. Hydraulic valves. 4,519,419, Cl. 137-596.000.
Petro, John D., to Commercial Shearing, Inc. Hydraulic valves. 4,519,420, Cl. 137-596.000.
Pfeiffer, Claus-Peter, to Metzeler Kautschuk GmbH. Flexible hollow body fillable with fluid medium. 4,520,054, Cl. 428-35.000.
Philibert, Daniel: *See—*
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,519,946, Cl. 260-239.55R.
Philip Morris Incorporated: *See—*
Grollimund, Everett C., 4,519,680, Cl. 350-486.000.
Philips, D. Colin: *See—*
Yannopoulos, Lymperios N.; Straw, Robert D.; and Philips, D. Colin, 4,520,157, Cl. 524-462.000.
Phillips, Bobby M., to Eastman Kodak Company. Textile yarns with loops and free protruding ends. 4,519,200, Cl. 57-246.000.
Phillips, Parker V.; Lakdawala, Ness; and Lecompte, Michel, to Hussmann Corporation. Supermarket environmental control system. 4,519,217, Cl. 62-256.000.
Photo Vending Corporation: *See—*
McElwee, J. Russell, 4,519,522, Cl. 221-13.000.
Phytogen: *See—*
Bonner, James F., 4,519,163, Cl. 47-58.000.
Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See—*
Ikeda, Yasuo, 4,520,238, Cl. 179-121.00C.
Pinsky, Michael L.: *See—*
Copenhafer, William C.; and Pinsky, Michael L., 4,519,806, Cl. 23-302.00T.
Pioneer Electronic Corporation: *See—*
Ishii, Satoshi, 4,520,322, Cl. 330-263.000.
Nakayama, Kazuaki, 4,520,323, Cl. 330-268.000.
Watanabe, Kazuo; Ohkubo, Yuichi; Haeno, Akira; and Yokogawa, Fumihiko, 4,520,282, Cl. 307-491.000.
Yoshida, Kobun, 4,520,412, Cl. 360-96.100.
Piotrowski, Chester; Bendson, Steven A.; Loeding, Neil W.; and Mularie, William M., to Minnesota Mining and Manufacturing Company. Integrated magnetostrictive-piezoelectric-metal oxide semiconductor magnetic playback head. 4,520,413, Cl. 360-113.000.
Pischtschan, Alfred: *See—*
Zabrocki, Karl; Ott, Karl-Heinz; Schmidt, Adolf; and Pischtschan, Alfred, 4,520,165, Cl. 525-84.000.
Pitney Bowes Inc.: *See—*
Lowe, Lynnwood, 4,519,311, Cl. 101-109.000.
Pitt, Gillies D.; Williamson, Roger J.; Batchelder, David N.; and Prabakaran, Arulanandam M., to International Telephone & Telegraph Corp. Vortex shedding fluid flowmeter. 4,519,259, Cl. 73-861.220.
Pitzer, Emory W.: *See—*
McGinnis, Roger N.; Drehman, Lewis E.; and Pitzer, Emory W., 4,520,223, Cl. 585-629.000.
Plastics Engineering Company: *See—*
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,520,198, Cl. 546-66.000.
Plastofilm Industries, Inc.: *See—*
Perchak, William C., 4,519,500, Cl. 206-312.000.
Podosek, Edward, to Dennison National Company. Spiral bound notebook and folder construction. 4,519,629, Cl. 281-25.00A.
Pohl, Herbert A.: *See—*
Kleinedler, Gary E.; and Pohl, Herbert A., 4,519,132, Cl. 29-845.000.
Pohlenz, Elmer E.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.
Poirier, Marc-Andre: *See—*
George, Albert E.; and Poirier, Marc-Andre, 4,519,915, Cl. 210-663.000.
Polaroid Corporation: *See—*
Burkhardt, James L.; and McCann, John J., 4,520,403, Cl. 358-332.000.
Kinsman, Gordon F.; Lambert, Ronald F.; and Morrison, David A., 4,519,689, Cl. 354-304.000.
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,520,189, Cl. 528-331.000.
Poll, Ian; and Smit, Jacobus A. J., to Shell Oil Company. Burner for the partial combustion of solid fuel. 4,519,321, Cl. 110-263.000.
Pollner, Rudolf, to Robert Bosch GmbH. Method of inserting a center electrode in a spark plug insulator. 4,519,784, Cl. 445-7.000.
Polyakov, Ivan P.: *See—*
Sychev, Anatoly P.; Sannikov, Jury I.; Grinin, Jury A.; Polyakov, Ivan P.; and Abdeev, Jury M., 4,519,836, Cl. 75-25.000.
Polydex Chemicals Ltd.: *See—*
Healy, George M.; and Curry, Kenneth D., 4,520,107, Cl. 435-240.000.
Popovic, Mikulas: *See—*
Gallo, Robert C.; Popovic, Mikulas; and Sarngadharan, Mangalaseril G., 4,520,113, Cl. 436-504.000.
Porta Systems Corp.: *See—*
De Luca, Paul V., 4,519,663, Cl. 339-99.00R.
Porter, Richard A. Gate with multiple pivot axes for rail members. 4,519,164, Cl. 49-108.000.
Porth, Roland W.: *See—*
Lehman, Richard F.; Porth, Roland W.; and Mason, Lawrence J., 4,519,703, Cl. 355-69.000.
Postnikov, Viktor M.: *See—*
Chachin, Viktor N.; Kolos, Vladimir K.; Botyan, Viktor V.; and Postnikov, Viktor M., 4,519,230, Cl. 72-56.000.
Potzick, James E.; and Robertson, Baldwin, to United States of America, Commerce. Synchronous phase marker and amplitude detector. 4,520,320, Cl. 328-133.000.
Poulin, Susan B.: *See—*
Hamel, Roger G.; and Poulin, Susan B., 4,520,137, Cl. 521-79.000.
Poulin, Ted M.: *See—*
Elmore, Carl L.; Poulin, Ted M.; and Barrett, Mark D., 4,519,446, Cl. 165-101.000.
Pozzobon, Alessandro, to Nordica S.p.A. Device for adjusting the flex in rear-entry ski boots. 4,519,149, Cl. 36-121.000.
PPG Industries, Inc.: *See—*
Demarest, Henry M., Jr., 4,519,814, Cl. 65-27.000.
Prabakaran, Arulanandam M.: *See—*
Pitt, Gillies D.; Williamson, Roger J.; Batchelder, David N.; and Prabakaran, Arulanandam M., 4,519,259, Cl. 73-861.220.
Prater, Keith B.; Thrash, Robert J.; and Connolly, John F., to Standard Oil Company (Indiana). Non-aqueous electrochemical cell and electrolyte. 4,520,083, Cl. 429-101.000.
Prepodnik, Kay E.; Finn, Peter A.; and Manning, Daniel J., to Kelch Corp., The. Receptacle for beverage container. 4,519,219, Cl. 62-457.000.
Prestige Billiards Pty. Ltd.: *See—*
Schill, Alfred G., 4,519,607, Cl. 273-5.00B.
Preuss, Wolfgang, to Henkel Kommanditgesellschaft auf Aktien. Steroid-20-carboxylic acid compounds and a process for their production. 4,519,949, Cl. 260-397.100.
Pribnow, Hans-Hermann: *See—*
Iseli, Jakob; and Pribnow, Hans-Hermann, 4,519,474, Cl. 180-279.000.
Procedyne Corp.: *See—*
Staffin, H. Kenneth; Roaper, Robert B.; and Bickford, Karin S., 4,519,718, Cl. 374-45.000.
Prodel, Jacques: *See—*
Prodel, Maurice; and Prodel, Jacques, 4,519,491, Cl. 198-349.000.
Prodel, Maurice; and Prodel, Jacques. Apparatus for the assembly and/or machining of circulating and immobilizable parts carried by pallets. 4,519,491, Cl. 198-349.000.
Professional Packaging Limited: *See—*
Holmes, Gordon W., 4,519,630, Cl. 281-31.000.
PROMA Produkt-und Marketing Gesellschaft mbH: *See—*
Lipinski, Reinhard, 4,519,297, Cl. 92-88.000.
Propane Carburetion Company, Inc.: *See—*
Nolff, Robert L., 4,519,347, Cl. 123-195.00A.
Puccini, Sergio E.: *See—*
Simmons, Nathaniel; Puccini, Sergio E.; Magnusson, Stig E.; and Parikh, Kamal I., 4,520,478, Cl. 370-63.000.
Puls, Jurgen: *See—*
Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, 4,520,105, Cl. 435-163.000.
Puntener, Alois, to Ciba-Geigy Corporation. Use of 1:2 cobalt complex dyes for dyeing leather or furs. 4,519,802, Cl. 8-404.000.

Purzycki, Kenneth L.: *See—*
Dahill, Robert T.; Purzycki, Kenneth L.; and Golle, Erlinda F., 4,519,944, Cl. 252-522.00R.

Pyde, Edwin: *See—*
Stone, Albert; Pyde, Edwin; and Carveth, Peter, 4,519,499, Cl. 206-219.000.

Quaker Oats Company, The: *See—*
Godsey, H. Dean; Schoen, Donald F.; and Turek, Joseph F., 4,519,713, Cl. 366-79.000.

Qualeatti, Gail M.; and Arena, Blaise J., to UOP Inc. Selective reduction of fatty materials using a supported group VIII metal in eggshell distribution. 4,519,951, Cl. 260-409.000.

Queille, Philippe: *See—*
Kostelitz, Michel; and Queille, Philippe, 4,519,853, Cl. 148-16.500.

Quets, Jean M.: *See—*
Jackson, John E.; Adler, Thomas A.; Quets, Jean M.; and Tucker, Robert C., Jr., 4,519,840, Cl. 106-1.050.

Quinn, Ross A.: *See—*
Luce, Robert S.; Quinn, Ross A.; and Rowley, Leroy S., 4,519,710, Cl. 356-411.000.

Quirin, Michel: *See—*
Aron, Jerome; and Quirin, Michel, 4,519,194, Cl. 56-370.000.

R. R. Donnelley & Sons Company: *See—*
Mayer, Theodore W., 4,519,599, Cl. 270-53.000.

Raab, Clifford G. Champagne bottle opener. 4,519,277, Cl. 81-3.550.

Rabinowitz, Mario; and Perry, E. Robert, to Electric Power Research Institute, Inc. Cores for electromagnetic apparatus and methods of fabrication. 4,520,078, Cl. 428-636.000.

Rachner, Horst: *See—*
Goertler, Horst; and Rachner, Horst, 4,520,271, Cl. 290-38.00C.

Radiometer A/S: *See—*
Andersen, Jorgen, 4,519,402, Cl. 128-765.000.

Radtke, Hartmut: *See—*
Kiesewetter, Holger; Jung, Friedrich; Radtke, Hartmut; and Witt, Reinhard, 4,519,239, Cl. 73-55.000.

Raeder, Willy: *See—*
Denton, Anthony D., 4,520,262, Cl. 250-221.000.

Ragnegard, Samuel; Strid, Kent; and Sundkvist, Goran, to AB Hedemora Verkstalder. Apparatus for removing a fiber layer from a rotating disc filter. 4,519,910, Cl. 210-327.000.

Rakes, James M.: *See—*
Firth, Rowland V. D., III; Goff, Willie, Jr.; Ku, Ta C.; and Rakes, James M., 4,520,371, Cl. 346-76.0PH.

Ralston, Robert. Ladder stabilizing apparatus. 4,519,477, Cl. 182-107.000.

Ramirez, Ernest R.: *See—*
De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.

Rance, William G., Jr.: *See—*
Campbell, Jesse L.; Fennema, Alan A.; Henderson, Robert B.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,519,553, Cl. 242-56.00R.

Randall Corporation, The: *See—*
Huebel, Robert R., 4,519,824, Cl. 62-26.000.

Randle, James N., to Austin Rover Group Limited. Vehicle suspensions. 4,519,628, Cl. 280-701.000.

Randlett, M. Ronald: *See—*
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., 4,519,118, Cl. 29-121.500.

Randol, Kent B.: *See—*
Harden, Eldon A.; and Randol, Kent B., 4,519,461, Cl. 172-225.000.

Randolph, Donald A.; and Watkins, Kenneth R., to USG Corporation. Pressure coating of mineral fillers. 4,520,073, Cl. 428-405.000.

Ranger, Alan E., to International Octrooi Maatschappij "Octropa" B.V. Method and apparatus for coating paper and the like. 4,520,048, Cl. 427-350.000.

Ranzi, Eliseo: *See—*
Minet, Ronald G.; Dente, Mario; Ranzi, Eliseo; and Sunny H. K., 4,520,217, Cl. 585-415.000.

Rasmuson, Torgny: *See—*
Hultmark, Dan; Steiner, Hakan; Rasmuson, Torgny; and Boman, Hans G., 4,520,016, Cl. 514-12.000.

Rauch, Gary C.; and Krause, Robert F., to Westinghouse Electric Corp. Transformer with ferromagnetic circuits of unequal saturation inductions. 4,520,335, Cl. 336-212.000.

Rauch, Hubert: *See—*
Lehmann, Klaus; Dreher, Dieter; Rauch, Hubert; and Siol, Werner, 4,520,172, Cl. 525-369.000.

Raulin, Jean M.; and Bonnerot, Georges, to Telecommunications Radioelectriques et Telephoniques T. R. T. Transmission system using differential pulse code modulation with adaptive prediction. 4,520,491, Cl. 375-27.000.

Rautenberg, Karl, to Forsheda AB. Mold for manufacturing an annular object of elastic material. 4,519,567, Cl. 249-57.000.

Raychem Corporation: *See—*
Frank, Louis M., 4,520,417, Cl. 361-45.000.

Raymond, Beach D. Tooth brush. 4,519,109, Cl. 15-110.000.

Raytheon Company: *See—*
Gentilman, Richard L.; Maguire, Edward A.; and Dolhert, Leonard E., 4,520,116, Cl. 501-98.000.
Perlmutter, Michael S.; and Braun, Kenneth H., 4,519,708, Cl. 356-350.000.

Raz, Zeev. Bathroom cabinet. 4,519,656, Cl. 312-256.000.

Razumovsky, Mikhail I.: *See—*
Gudkin, Timofei S.; Iordanishvili, Evgeny K.; Lidorenko, Nikolai S.; Malkovich, Bella E.; Razumovsky, Mikhail I.; and Rubashov, Igor B., 4,519,389, Cl. 128-303.100.

RCA Corporation: *See—*
Carlin, Donald B., 4,520,471, Cl. 369-112.000.
Dischert, Robert A.; and Libbey, Robert L., 4,520,396, Cl. 358-167.000.
Hsu, Sheng T., 4,519,126, Cl. 29-571.000.
Hurst, Robert N., Jr., 4,520,402, Cl. 358-324.000.
Reno, Charles W., 4,520,472, Cl. 369-112.000.
Tarng, Ming L.; and Romito, William S., 4,520,312, Cl. 324-158.00D.
van Hekken, Frans; and Chen, Hsing-Yeo, 4,520,292, Cl. 313-412.000.
Westerman, Harry H., Jr., 4,519,767, Cl. 425-308.000.

Reaume, Leonard V., to Magna American Corporation. Power drive rear tine tiller with reversing gear transmission for the tines. 4,519,459, Cl. 172-42.000.

Reddy, Kammalathinna V.; and Berry, Michael J., to Allied Corporation. Isotope separation by laser excitation of unimolecular reactants. 4,519,882, Cl. 204-158.00R.

Redele, Jean E. A., to Sxoma-Energie. Fuel heating method and device for vehicles. 4,519,358, Cl. 123-557.000.

Reich, Heinrich: *See—*
Strohmaier, Ernst; Reich, Heinrich; and Wagner, Bernd, 4,519,780, Cl. 433-29.000.

Reichert, Harry J., Jr., to General Instrument Corporation. Subscriber terminal for monitoring radio-frequency signal ingress into cable television systems. 4,520,508, Cl. 455-4.000.

Reinecke, Erich, to WABCO Fahrzeugbremsen GmbH. Gear selector unit for a transmission. 4,519,266, Cl. 74-471.0XY.

Reiner, Roland, to Hoffmann-La Roche Inc. 5-Oxo-as-triazines. 4,520,195, Cl. 544-182.000.

Reinmold, Heinz-Josef: *See—*
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schmitz, Alfred; and Mund, Heinz, 4,519,167, Cl. 51-165.770.

Remmel, Hans: *See—*
Schwarze, Werner; Kleemann, Axel; Remmel, Hans; and Hohn, Wolfgang, 4,520,209, Cl. 560-124.000.

Remote Switch Systems, Inc.: *See—*
Fields, Gary C.; and Long, Gary E., 4,520,234, Cl. 179-2.00A.

Renaud, Pierre, to Valeo. Clutch release bearing. 4,519,488, Cl. 192-98.000.

Renger, Larry H.: *See—*
Halford, Wayne R.; Renger, Larry H.; and Dooley, James J., 4,519,789, Cl. 446-444.000.

Reno, Charles W., to RCA Corporation. Beam expansion and relay optics for laser diode array. 4,520,472, Cl. 369-112.000.

Repass, James T.: *See—*
Hagler, Brenda J.; and Repass, James T., 4,520,457, Cl. 364-900.000.

Resan, Stevan A., to Carlisle Corporation. Lubricated roofing membrane fastener. 4,519,175, Cl. 52-713.000.

Research Corporation: *See—*
Miller, Ronald L., 4,520,111, Cl. 436-501.000.

Reusser, Robert E.; Kenton, Joseph R.; and Todd, Elizabeth A. Polymerization catalyst and deodorizing agent and process of use. 4,520,222, Cl. 585-526.000.

Rex, John D.: *See—*
Walker, Ronald P.; Rex, John D.; and Schummers, John H., 4,520,504, Cl. 382-1.000.

Rexnord Inc.: *See—*
Rooney, Thomas C., 4,519,907, Cl. 210-257.100.

Reynolds, Jeannette. Flyguard. 4,519,187, Cl. 54-81.000.

Reynolds Metals Company: *See—*
Dingus, Jack D.; and Gilliam, Edward C., 4,519,489, Cl. 193-31.00R.

Rhone-Poulenc Chimie de Base: *See—*
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Rhone-Poulenc Industries: *See—*
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Rhone-Poulenc Specialites Chimiques: *See—*
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,519,844, Cl. 106-209.000.

Rhyne Fibers, Inc.: *See—*
Rhyne, Ralph H., 4,519,114, Cl. 19-200.000.

Rhyne, Ralph H., to Rhyne Fibers, Inc. Apparatus and method for cleaning textile fiber. 4,519,114, Cl. 19-200.000.

Rialland, Jean P.; and Barbier, Jean P., to Laiteries E. Bridel. Process for treating milk with a cation-exchange resin for the preparation of decationized, acidified milk. 4,520,036, Cl. 426-271.000.

Ribas, Jean L., to Majorette. System for elastically assembling two pieces. 4,519,724, Cl. 403-345.000.

Ribi, Edgar E.; Cantrell, John L.; and Schwartzman, Steven M., to Ribi ImmunoChem Research, Inc. Stable composition and preparation thereof. 4,520,019, Cl. 424-195.100.

Ribi ImmunoChem Research, Inc.: *See—*
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Richardson-Vicks Inc.: *See—*
Dines, Allen I.; Yeung, David; and Nacht, Sergio, 4,520,133, Cl. 514-568.000.

Richter, Horst: *See—*
Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, 4,519,997, Cl. 423-265.000.

Ricoh Company, Ltd.: *See—*
Ishikawa, Chuji; Iwasaki, Kyuhachiro; Horike, Masanori; and Komai, Hiromichi, 4,520,367, Cl. 346-75.000.
Mayer, Edward F.; and van Blerk, Victor B., 4,519,699, Cl. 355-15.000.
Murai, Kazuo; and Hasegawa, Yutaka, 4,519,695, Cl. 355-14.00R.

Riddiford, Frederick A., to British Petroleum Company p.l.c., The. Ignition system. 4,519,453, Cl. 166-303.000.

Rieter Machine Works, Ltd.: *See—*
Gujer, Peter; Guldenfels, Dieter; Wirz, Armin; Knopp, Hans; Herion, Dieter; and Conzelmann, Gerhard, 4,519,115, Cl. 28-255.000.
von Burg, Paul; Wirz, Armin; and Graf, Felix, 4,519,778, Cl. 432-35.000.
Weber, Kurt; Mondini, Giancarlo; and Mandl, Gerhard, 4,519,821, Cl. 55-290.000.

Riha, Gerd, to Siemens Aktiengesellschaft. Electronic component functioning with reflected acoustic waves. 4,520,330, Cl. 333-195.000.

Riley, Robert F.; Meyer, Thomas I.; and Jordan, Wesley N., to Westinghouse Electric Corp. High pressure electrical penetrator. 4,519,662, Cl. 339-94.00R.

Rion Kabushiki Kaisha: *See—*
Hori, Kiyoharu, 4,519,399, Cl. 128-724.000.

Ripani, Sergio, to Carle & Montanari S.p.A. Device for controlling and monitoring the thickness of a chocolate film delivered by chocolate refiners. 4,519,304, Cl. 99-489.000.

Risch, Joel V. Backhoe clamping device. 4,519,739, Cl. 414-724.000.

Ristow, Delano H. Waterproof roof. 4,519,172, Cl. 52-96.000.

Ritchie, Robert J., to Du Pont de Nemours, E. I., and Company. Cathodic electrodeposition of charged aqueous powder slurry. 4,519,884, Cl. 204-181.00C.

Rivolier, Michel: *See—*
Bartholomaus, Reiner; and Rivolier, Michel, 4,519,573, Cl. 251-30.000.

Roanoke College: *See—*
Frantz, Virgil L., 4,519,819, Cl. 55-162.000.

Roaper, Robert B.: *See—*
Staffin, H. Kenneth; Roaper, Robert B.; and Bickford, Karin S., 4,519,718, Cl. 374-45.000.

Robert Bosch GmbH: *See—*
Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Straubel, Max, 4,519,352, Cl. 123-373.000.
Krimmer, Erwin; and Fehrenbach, Siegfried, 4,520,227, Cl. 174-65.00R.
Kubach, Hans; Kienzle, Wolfgang; Paschke, Werner; and Sauer, Rudolf, 4,519,547, Cl. 239-585.000.
Locher, Johannes; and Schmidt, Wolfgang, 4,520,419, Cl. 361-104.000.
Pollner, Rudolf, 4,519,784, Cl. 445-7.000.

Robert Linkletter Associates, Inc.: *See—*
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,519,514, Cl. 215-225.000.

Roberts, Lewis L., to Mercury Development Corp. Slab-hanging system. 4,519,173, Cl. 52-235.000.

Robertshaw Controls Company: *See—*
Ochsner, Rolf H., 4,520,245, Cl. 200-82.00R.

Robertson, Baldwin: *See—*
Potzick, James E.; and Robertson, Baldwin, 4,520,320, Cl. 328-133.000.

Robeson, Lloyd M.: *See—*
Harris, James E.; and Robeson, Lloyd M., 4,520,067, Cl. 428-323.000.

Robinson, Edward L., Jr.: *See—*
Wunschl, Nicholas H.; and Robinson, Edward L., Jr., 4,519,525, Cl. 221-211.000.

Robinson, Michael, to Laporte Industries Limited. Treatment of oxidic materials. 4,519,987, Cl. 423-60.000.

Rock Bit Industries U.S.A., Inc.: *See—*
Garner, Lloyd L., 4,519,614, Cl. 277-84.000.

Rockwell International Corporation: *See—*
Bevilaqua, Paul M.; and Stachura, Stanley J., 4,519,990, Cl. 423-210.000.
Canning, Terry D.; and Hovan, Francis E., 4,519,667, Cl. 339-186.00M.
Hogge, Charles R., Jr., 4,520,489, Cl. 375-14.000.
Marusik, C. Lee, 4,520,275, Cl. 307-64.000.
Rosman, Irwin E.; and Bourgeois, Hector S., 4,519,745, Cl. 416-96.00A.
Searl, Eugene P., 4,520,476, Cl. 370-32.000.
Sutherland, Ray, 4,520,423, Cl. 361-380.000.

Rodriguez, Carl R.: *See—*
Kirk, Johnie C., 4,519,158, Cl. 43-17.000.

Rogers Corporation: *See—*
Woelfel, Robert, 4,520,248, Cl. 200-340.000.

Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., to Polaroid Corporation. Optical device including birefringent aromatic amino carboxylic acid polymer. 4,520,189, Cl. 528-331.000.

Rogers, Walter C., Jr., to Parma Corporation. Rocker-recliner chair. 4,519,647, Cl. 297-85.000.

Rogstadius, Ivan. Method for obtaining an accurate concentric fastening of an optical fibre in a connector. 4,519,672, Cl. 350-96.200.

Rohde, Thomas; and Caspers, Friedhelm, to Elektro Physik Hans Nix & Dr. Erich Steingroever. Process and device for the nondestructive measurement of material accumulations or coating thicknesses on dielectric materials, in particular plastic. 4,520,308, Cl. 324-58.50R.

Rohm GmbH: *See—*
Lehmann, Klaus; Dreher, Dieter; Rauch, Hubert; and Siol, Werner, 4,520,172, Cl. 525-369.000.

Rohr Industries, Inc.: *See—*
Timms, Richard H., 4,519,561, Cl. 244-110.00B.

Rohrbach, Carl: *See—*
Wainauski, Harry S.; and Rohrbach, Carl, 4,519,746, Cl. 416-223.00R.

Roireau, Jeanne M., executrix: *See—*
Logan, Andrew H.; and Wagner, Robert A., deceased, 4,519,559, Cl. 244-17.170.

Rolls-Royce Inc.: *See—*
Szuminski, Gary F.; and Jones, Thomas J., 4,519,543, Cl. 239-265.190.

Rolls-Royce Limited: *See—*
Mills, David; Kington, Alan D.; and Lovell, Philip J., 4,520,117, Cl. 501-107.000.
Szuminski, Gary F.; and Jones, Thomas J., 4,519,543, Cl. 239-265.190.

Romancik, Guna: *See—*
Lowe, David A.; Romancik, Guna; Cappelletti, Leonardo M.; and Elander, Richard P., 4,520,101, Cl. 435-49.000.

Romito, William S.: *See—*
Tarng, Ming L.; and Romito, William S., 4,520,312, Cl. 324-158.00D.

Rood, Dennis D.: *See—*
Gray, Floyd R.; and Rood, Dennis D., 4,519,451, Cl. 166-278.000.

Rooney, Thomas C., to Rexnord Inc. Grit settling basin including vane pump. 4,519,907, Cl. 210-257.100.

Roper, Rudolf, to Norton Christensen, Inc. Auxiliary controlled valve disposed in a drilling string. 4,519,574, Cl. 251-31.000.

Rosemount Inc.: *See—*
Frick, Roger L., 4,519,253, Cl. 73-718.000.

Rosen, Gerald M. N-alkyl-4'-hydroxyacetanilides, pharmaceutical compositions comprising them and their use. 4,520,134, Cl. 514-625.000.

Rosen, Haim, to Rotoplas, Ltd. Process for preparing plastic articles having an outer shell and inner foam core. 4,519,964, Cl. 264-45.400.

Rosenberg, Gideon, to State of Israel, Ministry of Defence, Rafael Development Authority, The. Sub-caliber projectile. 4,519,317, Cl. 102-521.000.

Rosman, Irwin E.; and Bourgeois, Hector S., to Rockwell International Corporation. Rotor blade and stator vane using ceramic shell. 4,519,745, Cl. 416-96.00A.

Rosseels, Gilbert; and Inion, Henri, to S. A. Labaz N.V. Indolizine derivatives and use as cardiovascular agents. 4,520,026, Cl. 514-299.000.

Rossmy, Gerd: *See—*
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.

Rostrup-Nielsen, Jens R.: *See—*
Skov, Allan; and Rostrup-Nielsen, Jens R., 4,520,216, Cl. 585-315.000.

Roth, Donald J.; Kubis, Charles S.; Walter, John; and Mohr, Glenn R., to Continental Can Company, Inc. Heating system for and method of finally bonding container end unit to body. 4,519,859, Cl. 156-69.000.

Roth, Robert G. Forming machine including drive mechanism having rack and gear synchronization. 4,519,231, Cl. 72-88.000.

Rotolico, Anthony J., to Eutectic Corporation. Torch flame spray system. 4,519,541, Cl. 239-1.000.

Rotoplas, Ltd.: *See—*
Rosen, Haim, 4,519,964, Cl. 264-45.400.

Rottmaier, Ludwig: *See—*
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,520,147, Cl. 524-100.000.

Rouse, Michael W., to Waste Recovery, Inc. Material guide and cleaner for comminuting apparatus. 4,519,550, Cl. 241-167.000.

Roussel Uclaf: *See—*
Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, 4,519,946, Cl. 260-239.55R.

Roussos, Josiane: *See—*
Chaux, Jean-Bernard; Gagne, Pierre; Garcia, Michel; Lespinasse, Dominique; and Roussos, Josiane, 4,519,844, Cl. 106-209.000.

Rowe, Raymond A., to United States of America, Navy. Fluid responsive rotor generator. 4,520,273, Cl. 290-54.000.

Rowlands, Ronald H.: *See—*
Houvig, Felix J.; and Rowlands, Ronald H., 4,520,488, Cl. 375-5.000.

Rowles, Howard C.: *See—*
Bernhard, Dennis P.; Rowles, Howard C.; and Teichman, Robert L., 4,519,825, Cl. 62-28.000.

Rowley, Leroy S.: *See—*
Luce, Robert S.; Quinn, Ross A.; and Rowley, Leroy S., 4,519,710, Cl. 356-411.000.

Rubashov, Igor B.: *See—*
Gudkin, Timofei S.; Iordanishvili, Evgeny K.; Lidorenko, Nikolai S.; Malkovich, Bella E.; Razumovsky, Mikhail I.; and Rubashov, Igor B., 4,519,389, Cl. 128-303.100.

Rubey, Ulyss R., to Detectors, Inc. Apparatus for automated assembly of shock detectors. 4,519,867, Cl. 156-351.000.

Rubin, Matvei. Brush. 4,519,110, Cl. 15-159.00R.

Ruggeri, Stefano. Selfcentering work-rest. 4,519,279, Cl. 82-38.00R.

Rulseh, Roy M.: *See—*
Parish, Mark G.; and Rulseh, Roy M., 4,519,773, Cl. 431-176.000.

Runions, Alton E.: *See*—
Mayer, William; and Runions, Alton E., 4,520,432, Cl. 362-267.000.

Russ, James J.; Smith, John W.; and Condra, Janet S., to Hydro Fuels, Inc. Methods for removing pollutants from water and waste water and for reducing sludge resistance to dewatering. 4,519,921, Cl. 210-716.000.

Russell, Derek V., to Alphacrete Construction Linings (UK) Limited. Method for reinforcing tubular ducts. 4,519,177, Cl. 52-745.000.

Russell, Gordon A., to Mobil Oil Corporation. Device for holding formation cores for boring. 4,519,592, Cl. 269-25.000.

Russo, Ronald D. Thoracic drainage device. 4,519,796, Cl. 604-319.000.

S. A. Labaz N.V.: *See*—
Rosseels, Gilbert; and Inion, Henri, 4,520,026, Cl. 514-299.000.

S.N.E.C.M.A.: *See*—
Loisy, Jean M.; and Menioux, Claude C. F., 4,519,208, Cl. 60-262.000.

Saab-Scania Aktiebolag: *See*—
Nilsson, Sten E.; and Elfverson, Sven E., 4,519,302, Cl. 98-2.080.

Sachdev, Harbans S.: *See*—
Anderson, Herbert R., Jr.; Sachdev, Harbans S.; and Sachdev, Krishna G., 4,519,872, Cl. 156-643.000.

Sachdev, Krishna G.: *See*—
Anderson, Herbert R., Jr.; Sachdev, Harbans S.; and Sachdev, Krishna G., 4,519,872, Cl. 156-643.000.

Sachs, Howard M.: *See*—
Becker, Mitchell; and Sachs, Howard M., 4,519,875, Cl. 203-28.000.

Safiuddin, Mohammed: *See*—
Snedden, William H.; and Safiuddin, Mohammed, 4,520,450, Cl. 364-607.000.

Sahatjian, Ronald A.: *See*—
Rogers, Howard G.; Bilofsky, Ruth C.; Gaudiana, Russell A.; and Sahatjian, Ronald A., 4,520,189, Cl. 528-331.000.

Saint-Gobain Vitrage: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schmitz, Alfred; and Mund, Heinz, 4,519,167, Cl. 51-165.770.

St. Jacques, John W.; and Couch, Robert P., to United Technologies Corporation. Electrostatic gas turbine surge/stall detection. 4,519,240, Cl. 73-116.000.

St. Joseph Bank and Trust Company, executor: *See*—
D'Alelio, Gaetano F., deceased; and Waitkus, Phillip A., 4,520,198, Cl. 546-66.000.

Saito, Seitoku; Izumi, Toshiaki; Kobuke, Takayoshi; and Sugihara, Hiroshi, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,520,076, Cl. 428-611.000.

Saitoh, Koichi: *See*—
Kimoto, Toshifumi; Itami, Teruhiko; Nishimura, Nobuo; and Saitoh, Koichi, 4,520,409, Cl. 360-59.000.

Saiwai, Kazuhiko: *See*—
Fujii, Yoshihiko; Tomita, Osamu; Taniguchi, Itaru; and Saiwai, Kazuhiko, 4,520,370, Cl. 346-76.00L.

Sakai Chemical Industry Co., Ltd.: *See*—
Abe, Kazunobu; and Nakatsuji, Tadao, 4,520,124, Cl. 502-159.000.

Sakai, Shinji: *See*—
Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, 4,519,685, Cl. 354-154.000.

Sakai, Takeshi: *See*—
Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,520,201, Cl. 548-342.000.

Sakairi, Tadashi: *See*—
Kenmochi, Kazuei; Sakairi, Tadashi; Maruyama, Yoshio; and Itemadani, Eizi, 4,519,761, Cl. 425-135.000.

Sakamoto, Akio: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Sakamoto, Kazunori: *See*—
Nakanishi, Yasuo; Sakamoto, Kazunori; Ando, Giichi; and Watanabe, Teruoki, 4,519,854, Cl. 148-127.000.

Sakamoto, Masaharu: *See*—
Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, 4,520,280, Cl. 307-358.000.

Sakata, Ko; and Imai, Hirosuke, to Nippon Oil Co. Ltd. Process for producing water-insoluble polymers of uniform shape from gelled salts of alginic acid. 4,520,178, Cl. 526-200.000.

Sakitani, Yoshio; and Minamikawa, Yoshihisa, to Hitachi, Ltd. Specimen supporting device. 4,520,421, Cl. 361-234.000.

Sakurai, Akira; and Mizutani, Hiroshi, to Kao Corporation. Sanitary napkin. 4,519,799, Cl. 604-366.000.

Sakurai, Masaki: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Yusa, Yasuhiro; Sakurai, Masaki; and Yoshihara, Kenji, 4,520,473, Cl. 369-126.000.

Salazar, Jose A.: *See*—
Morales, Alfredo L.; Galiasso, Roberto E.; Agudelo, Maria M.; Salazar, Jose A.; and Carrasquel, Angel R., 4,520,128, Cl. 502-210.000.

Salinas Valley Engineering & Manufacturing, Inc.: *See*—
Crabb, Richard V., Jr., 4,519,178, Cl. 53-137.000.

Salomon S.A.: *See*—
Bressand, Rene ; and Desarmaux, Pierre, 4,519,624, Cl. 280-633.000.

Samans, Robert: *See*—
Hillemanns, Herbert; Samans, Robert; and Meyer, Walter, 4,520,047, Cl. 427-331.000.

Sanborn, Dale. Band sawmill. 4,519,283, Cl. 83-104.000.

Sanders Associates, Inc.: *See*—
Liu, Dean-Yuan, 4,520,372, Cl. 346-136.000.

Sandi, Floyd J.; and Vultaggio, Anthony, to Essex Group, Inc. Multiple push button switch with latch members. 4,520,241, Cl. 200-5.00B.

Sandquist, Ralph. Spine board. 4,519,106, Cl. 5-82.00R.

Sands, Ned R. Sliding ring game. 4,519,611, Cl. 273-126.00R.

Sanguu, Isao: *See*—
Sekiguchi, Toru; and Sanguu, Isao, 4,520,410, Cl. 360-77.000.

Sanifoam, Inc.: *See*—
Kramer, Fritz; Skornscheck, Thomas E.; and Strauss, Ernest, 4,519,338, Cl. 118-305.000.

Sannikov, Jury I.: *See*—
Sychev, Anatoly P.; Sannikov, Jury I.; Grinin, Jury A.; Polyakov, Ivan P.; and Abdeev, Jury M., 4,519,836, Cl. 75-25.000.

Sano, Tetsuo; Orita, Susumu; Yamazaki, Masaya; and Moriyama, Kazuhiro, to Tokyo Shibaura Denki Kabushiki Kaisha. Air conditioner. 4,519,214, Cl. 62-156.000.

Santi, John D., to Briggs & Stratton Corp. Ignition magneto having an improved primary winding construction. 4,520,288, Cl. 310-194.000.

Sanwa Kako Company Limited: *See*—
Yoshida, Iwao; Kasanami, Takeo; and Miura, Shuji, 4,519,963, Cl. 264-45.300.

Sanyo Electric Co. Ltd.: *See*—
Murakami, Yoshihiro; and Hosoya, Nobukazu, 4,520,328, Cl. 332-31.00T.

Sargent-Welch Scientific Company: *See*—
Hanson, David E., 4,519,755, Cl. 418-9.000.

Sarich, Tony R., to Orbital Engine Company Proprietary Limited. Internal combustion engine fuel and air system. 4,519,356, Cl. 123-533.000.

Sarkisian, Robert: *See*—
Seely, James R.; and Sarkisian, Robert, 4,519,152, Cl. 40-156.000.

Sarngadharan, Mangalasseril G.: *See*—
Gallo, Robert C.; Popovic, Mikulas; and Sarngadharan, Mangalasseril G., 4,520,113, Cl. 436-504.000.

Sasaki, Akihiko; Arai, Kouji; Takashi, Takano; and Namiki, Yasuomi, to Victor Company of Japan, Ltd. Insert recording system for a video signal. 4,520,405, Cl. 360-10.300.

Sasaki, Hajime; and Nishiyama, Shinichi, to Hitachi Cable, Ltd. Fin materials for automobile radiators. 4,519,980, Cl. 420-474.000.

Sasaki, Issei: *See*—
Mansfield, Robert J.; Payne, David N.; and Sasaki, Issei, 4,519,704, Cl. 356-73.100.

Sasaki, Itsuo; and Suzuki, Hiroaki. Band pass filter with a switched capacitor. 4,520,283, Cl. 307-520.000.

Sasaki, Shunichi: *See*—
Iida, Takenobu; and Sasaki, Shunichi, 4,520,294, Cl. 315-50.000.

Sasaki, Yoshimasa: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Sasazawa, Kazuo: *See*—
Yamaoka, Nobutatsu; Tsukada, Akira; and Sasazawa, Kazuo, 4,519,942, Cl. 252-520.000.

Sassano, Daniel R., to Westinghouse Electric Corp. High hot bond strength high flash point low viscosity polyester insulating compositions. 4,520,161, Cl. 525-11.000.

Sato, Haruhito, to Idemitsu Kosan Company Limited. Process for the production of pseudocumene or durene. 4,520,219, Cl. 585-462.000.

Sato, Masahiro: *See*—
Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.

Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, to Omron Tateisi Electronics Co. Drive circuit for a piezo-electric element. 4,520,289, Cl. 310-316.000.

Sato, Yoshinori, to Japan Steel Works, Ltd., The. Apparatus for controlling a plurality of stud tensioning devices. 4,520,446, Cl. 364-468.000.

Satonaka, Shinobu: *See*—
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Satonaka, Shinobu; Kaminaga, Seiji; and Ishito, Mitsuya, 4,519,702, Cl. 355-51.000.

Satzler, Ronald L.; and Stevens, Samuel B., to Caterpillar Tractor Co. Roller suspension apparatus for a belted vehicle. 4,519,654, Cl. 305-27.000.

Sauer, Rudolf: *See*—
Kubach, Hans; Kienzle, Wolfgang; Paschke, Werner; and Sauer, Rudolf, 4,519,547, Cl. 239-585.000.

Saunders, James W., to Paccar Inc. Lower radiator mount. 4,519,467, Cl. 180-68.400.

Savidge, Michael: *See*—
Bevington, John F.; Meeker, Paul; and Savidge, Michael, 4,519,112, Cl. 15-326.000.

Schaaf, Antoine: *See*—
Peckels, Jean; and Schaaf, Antoine, 4,519,587, Cl. 266-80.000.

Schaefer, Lothar F. Tool for removing an electronic slide-in unit from a fixing rack. 4,519,130, Cl. 29-764.000.

Schaefer, Ronald J.: *See—*
Ahmad, Shamim; and Schaefer, Ronald J., 4,519,430, Cl. 152-209.00R.
Schaer, Leonard S., to Tekcast Industries, Inc. Front loading centrifugal spin caster. 4,519,971, Cl. 264-311.000.
Schendle, Robert N.: *See—*
Jackson, John C., II; and Schendle, Robert N., 4,519,502, Cl. 206-390.000.
Scher, Herbert I.: *See—*
Ungar, Israel S.; Scher, Herbert I.; and O'Neill, Nelson L., 4,520,062, Cl. 428-148.000.
Scherbatskoy, Serge A. Borehole measurement while drilling systems and methods. 4,520,468, Cl. 367-83.000.
Scherf, Thomas W.: *See—*
LaBarge, Robert L.; Green, Jerrold D.; Arndt, Eric D.; Horansky, Frank J.; Hawkins, Ronald G.; Leftault, Charles J., Jr.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,306, Cl. 100-35.000.
La Barge, Robert L.; Leftault, Charles J., Jr.; Arndt, Eric D.; Green, Jerrold D.; Hawkins, Ronald G.; Horansky, Frank J.; Pohlenz, Elmer E.; and Scherf, Thomas W., 4,519,307, Cl. 100-99.000.
Schick, Rupert: *See—*
Hahn, Klaus; Wittmer, Paul; De Grave, Isidoor; Schick, Rupert; and Echte, Adolf, 4,520,135, Cl. 521-56.000.
Schill, Alfred G., to Prestige Billiards Pty. Ltd. Game table. 4,519,607, Cl. 273-5.00B.
Schippers, Heinz, to Barmag Barmer Maschinenfabrik AG. Yarn twisting method and apparatus. 4,519,203, Cl. 57-328.000.
Schlegel Corporation: *See—*
Clarke, Robert T., Jr.; and Jasienski, Raymond, 4,519,729, Cl. 405-258.000.
Schlicker, Heinrich A., to AB Volvo. Parking brake in a vehicle transmission. 4,519,483, Cl. 192-4.00A.
Schlienkamp, Hubert, to Szabo Maschinenbau GmbH & Co. KG. Method and system for sealing the edges of insulating-glass panels. 4,519,962, Cl. 264-40.700.
Schlumberger Electronics (UK) Limited: *See—*
Dickson, John K., 4,519,251, Cl. 73-639.000.
Schmelzer Corporation: *See—*
Cheney, Jack E., 4,519,349, Cl. 123-198.00R.
Schmidt, Adolf: *See—*
Zabrocki, Karl; Ott, Karl-Heinz; Schmidt, Adolf; and Pischtschan, Alfred, 4,520,165, Cl. 525-84.000.
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, to Lim International S.A. Reinforced polyurethane tires. 4,519,432, Cl. 152-357.00A.
Schmidt, Gerhard S. E. Self-closing dispenser. 4,519,530, Cl. 222-494.000.
Schmidt, Wolfgang: *See—*
Locher, Johannes; and Schmidt, Wolfgang, 4,520,419, Cl. 361-104.000.
Schmitt, Gunter K.: *See—*
Weschenfelder, Otto T.; and Schmitt, Gunter K., 4,519,594, Cl. 270-20.100.
Schmitt, Hans-Georg; Palus, Wilfried; and Genth, Hermann, to Bayer Aktiengesellschaft. 3-(3-Iodopropargyl)-benzo-1,2,3-triazin-4-ones, and their use in microbicidal agents. 4,520,023, Cl. 514-241.000.
Schmitt, Walter, to Dr. Johannes Heidenhain GmbH. System for identifying reference marks in a path measuring device. 4,519,140, Cl. 33-125.00C.
Schmitz, Alfred: *See—*
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Schmitz, Alfred; and Mund, Heinz, 4,519,167, Cl. 51-165.770.
Schneider, Kurt; Heide, Wilfried; Hartmann, Juergen; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Preparation of concentrated aqueous solutions of quaternization products of tertiary aminoalkyl esters or tertiary aminoalkylamides of acrylic or methacrylic acid. 4,520,210, Cl. 560-222.000.
Schnur, Nicholas E.; and Beimesch, Bruce J., to National Distillers and Chemical Corporation. Low temperature hydraulic fluids based on two centistoke synthetic hydrocarbons. 4,519,932, Cl. 252-73.000.
Schoeff, Terry G.; and Hemmert, Raymond A., deceased (by First National Bank, executor), to American Standard Inc. Fireplace assembly. 4,519,376, Cl. 126-121.000.
Schoen, Donald F.: *See—*
Godsey, H. Dean; Schoen, Donald F.; and Turek, Joseph F., 4,519,713, Cl. 366-79.000.
Schoenberger, Frederick. Electrical energy saver. 4,520,259, Cl. 219-501.000.
Schonberger, Milton. Disc for indicator for tamper-evident lid. 4,519,515, Cl. 215-230.000.
Schott Glaswerke: *See—*
Speit, Burkhard; Mennemann, Karl; and Gliemeroth, Georg, 4,520,115, Cl. 501-60.000.
Schottel-Werft Josef Becker GmbH & Co KG.: *See—*
Krautkremer, Franz; Lais, Siegfried; Knecht, Reinhold; and Stache, Detlev, 4,519,335, Cl. 114-144.00R.
Schreiber, Adam; and Hilaire, Jacob, to Sulzer Brothers Limited. Joint socket. 4,519,101, Cl. 3-1.912.
Schreiber, Peter; and Huth, Klaus, to U.S. Philips Corporation. Rotary-anode X-ray tube. 4,520,496, Cl. 378-128.000.
Schreiber, William L.: *See—*
Fujioka, Futoshi; Boden, Richard M.; Schreiber, William L.; Whelan, Patrick; and Hanna, Marie R., 4,519,943, Cl. 252-522.00R.
Schroeder, Albert H.; Denisevich, Peter, Jr.; Suzuki, Shigeto; and Kurkov, Victor P., to Chevron Research Company. Triazole electroactive polymers. 4,519,940, Cl. 252-500.000.
Schrofelbauer, Herbert; and Staudinger, Gernot, to Osterreichische Draukraftwerke Aktiengesellschaft. Method of desulfurizing flue gases of coal firings. 4,519,995, Cl. 423-244.000.
Schuh, Frank J., to Atlantic Richfield Company. Drainhole drilling. 4,519,463, Cl. 175-61.000.
Schulte, Heinz, to G. L. Rexroth GmbH. Control-circuit throttle valve. 4,519,296, Cl. 91-388.000.
Schultz, Robert T. Control system for solar heaters. 4,519,379, Cl. 126-422.000.
Schumacher, Horst; and Grafen, Paul, to BASF Aktiengesellschaft. Production of dry powders of substances which are sensitive to oxidation. 4,519,961, Cl. 264-4.600.
Schummers, John H.: *See—*
Walker, Ronald P.; Rex, John D.; and Schummers, John H., 4,520,504, Cl. 382-1.000.
Schutt, Hartwig: *See—*
Lepper, Herbert; and Schutt, Hartwig, 4,520,211, Cl. 568-863.000.
Schwab, Carl E., to General Signal Corporation. Sensing vertical and horizontal visibility. 4,520,360, Cl. 340-947.000.
Schwanbom, Erik; Frankenberger, Horst; and Baum, Marcel, to Dragerwerk A.G. Respirator apparatus and method of operation thereof. 4,519,388, Cl. 128-204.250.
Schwartz, Frederic W., to Cable Electric Products, Inc. Electrical cord reel and storage system. 4,520,239, Cl. 191-12.400.
Schwartz, Marie A., executrix: *See—*
Schwartz, Sidney J., deceased, 4,520,459, Cl. 365-15.000.
Schwartz, Sidney J., deceased (by Schwartz, Marie A., executrix), to Burroughs Corporation. Bubble memory which transfers bubbles in both right-to-left and left-to-right SPS loops to provide a short access time. 4,520,459, Cl. 365-15.000.
Schwartzman, Steven M.: *See—*
Ribi, Edgar E.; Cantrell, John L.; and Schwartzman, Steven M., 4,520,019, Cl. 424-195.100.
Schwarz, Richard A., to Cosden Technology, Inc. Foamable polymeric styrene particles. 4,520,136, Cl. 521-60.000.
Schwarze, Werner; Kleemann, Axel; Remmel, Hans; and Hohn, Wolfgang, to Degussa Aktiengesellschaft. Process for cyclizing upsilon-chlorocarboxylic acids. 4,520,209, Cl. 560-124.000.
Schweers, Werner: *See—*
Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, 4,520,105, Cl. 435-163.000.
Schwob, Pierre; and Mieg, Christian, to SEB S.A. Electronic non-use power interruption safety device for an electric flat-iron. 4,520,257, Cl. 219-250.000.
SCM Corporation: *See—*
Fridman, Semyon D., 4,519,988, Cl. 423-76.000.
Hashiguchi, Don H.; Klar, Erhard; and Dietrich, Ronald J., 4,520,130, Cl. 502-345.000.
Scott, Gerald: *See—*
Gilead, Dan; and Scott, Gerald, 4,519,161, Cl. 47-9.000.
Scott, Michael H.: *See—*
Golobic, Robert A.; and Scott, Michael H., 4,519,715, Cl. 366-343.000.
SDS-Elektro GmbH: *See—*
Nagamoto, Mitsuki, 4,520,333, Cl. 335-129.000.
Seaboard Wellhead Control, Inc.: *See—*
Freeman, John W., 4,519,582, Cl. 251-328.000.
Searl, Eugene P., to Rockwell International Corporation. Apparatus for enabling the duplex operation of a transmitter and receiver. 4,520,476, Cl. 370-32.000.
SEB S.A.: *See—*
Schwob, Pierre; and Mieg, Christian, 4,520,257, Cl. 219-250.000.
Sebald, Dorothy D., executrix: *See—*
Sebald, Joseph F., deceased, 4,519,444, Cl. 165-47.000.
Sebald, Joseph F., deceased (by Sebald, Dorothy D., executrix), to Heat Power Products Corporation. Multi-unit sample cooler. 4,519,444, Cl. 165-47.000.
Security Shutter Corporation: *See—*
Forquer, William F., 4,519,434, Cl. 160-133.000.
Sedille, Marcel; and Le Creurer, Maurice, to Automobiles Peugeot-/Automobiles Citroen. Supercharger device for an internal combustion engine. 4,519,211, Cl. 60-602.000.
See, Benito: *See—*
Kawakami, James H.; See, Benito; Jones, Thomas R.; and Maresca, Louis M., 4,520,168, Cl. 525-169.000.
Seeger, G. Hans J.; Giesenberg, Peter; and Steimel, Johannes, to Bodenseewerk Geratetechnik GmbH. Locking device for air-to-air guided missiles. 4,519,291, Cl. 89-1.806.
Seely, James R.; and Sarkisian, Robert, to Marketing Displays, Inc. Tamper proof poster display device. 4,519,152, Cl. 40-156.000.
Seidel, Joseph, to Westinghouse Electric Corp. Control method for loading battery electrodes. 4,519,425, Cl. 141-1.100.
Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geisler, Helmut, to VEB Kombinat Textima. Continuously-operating machine for the treatment of animal hides and skins. 4,519,224, Cl. 69-30.000.
Seiki, Hiromichi, to Idemitsu Kosan Company Limited. Lubricant for use at high temperature. 4,519,927, Cl. 252-49.600.
Seiko Instruments & Electronics, Ltd.: *See—*
Fujita, Sumio, 4,520,502, Cl. 381-51.000.

Seino, Shunji: *See*—
Amano, Maschiro; Seino, Shunji; Nishiyama, Ryota; and Nozaki, Masaoki, 4,519,873, Cl. 162-138.000.
Seki, Hirokazu: *See*—
Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,520,201, Cl. 548-342.000.
Seki, Mitsuaki: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,520,373, Cl. 346-140.00R.
Seki, Yasutomo; Akiyama, Toshio; Nakabayashi, Norio; and Iizuka, Yutaka, to Nippon Kogaku K.K. Focusing screen of a camera. 4,519,686, Cl. 354-200.000.
Sekiguchi, Toru; and Sanguu, Isao, to Nippon Electric Co., Ltd. Scan tracking apparatus for helical scan video tape recorder. 4,520,410, Cl. 360-77.000.
Sekiya, Takashi: *See*—
Kamata, Nobuo; Sekiya, Takashi; Takeda, Kazutoshi; Hayasaka, Toyoo; and Yoshida, Tomohisa, 4,520,087, Cl. 429-219.000.
Seltz, Charles L., to King-Seeley Thermos Co. Dispensing stopper. 4,519,529, Cl. 222-484.000.
Selvi, Fabio. Transfer machine for overturning a textile tubular element for the sewing of the edges thereof and for the subsequent re-overturning and discharging. 4,519,327, Cl. 112-121.150.
Semmelrodt, Rolf: *See*—
Hausner, Gerd; and Semmelrodt, Rolf, 4,519,202, Cl. 57-264.000.
Sencorp: *See*—
Crutcher, John P., 4,519,535, Cl. 227-131.000.
Senga, Takao; Yamada, Jun; and Suzuki, Shigeyoshi, to Mitsubishi Paper Mills, Ltd. Method for making printing plates. 4,520,088, Cl. 430-49.000.
Sensormatic Electronics Corporation: *See*—
Gillette, Dennis; and Gentzler, David, 4,519,507, Cl. 209-682.000.
Seragnoli, Enzo, to G.D. Societa per Azioni. Spacer device for filter fitting machine. 4,519,405, Cl. 131-94.000.
Shackleton, Craig R., to Mead Corporation, The. Air piloted valve for controlling start/stop of an ink jet drop generator. 4,520,369, Cl. 346-75.000.
Shaffer, John W., to GTE Products Corporation. Life tungsten filament for incandescent lamp. 4,519,785, Cl. 445-48.000.
Shank, William E.; and Bercaw, Kenneth K., to Litton Industrial Products, Inc. Regulating wheelhead drive. 4,519,722, Cl. 403-26.000.
Sharon Manufacturing Company: *See*—
Hudson, Sharon J., Jr., 4,519,368, Cl. 123-468.000.
Sharp Kabushiki Kaisha: *See*—
Hibi, Hitoshi, 4,520,397, Cl. 358-168.000.
Miyoshi, Shuji; Sugihara, Takashi; Jinda, Akihito; and Hijikigawa, Masaya, 4,520,341, Cl. 338-35.000.
Sharps, Gordon V., Jr., to Mobil Oil Corporation. Method and apparatus for the production of a high-strength, tear-resistant polymer composite. 4,519,860, Cl. 156-161.000.
Shatterproof Glass Corp.: *See*—
Innis, David T., 4,519,885, Cl. 204-192.00R.
Shaw, Myron J. Firearm with interchangeable barrels. 4,519,156, Cl. 42-77.000.
Shaw, Robert R.: *See*—
Perry, Charles H.; and Shaw, Robert R., 4,519,851, Cl. 148-6.310.
Shaw, Stuart W. K., to INCO Europe Limited. Nickel-chromium-cobalt base alloys and castings thereof. 4,519,979, Cl. 420-448.000.
Shedd, Clifford M. Temperature actuated burner igniter. 4,519,774, Cl. 431-267.000.
Shell Oil Company: *See*—
Berni, Albert J., 4,520,467, Cl. 367-24.000.
Entwistle, Ian D.; and Boehm, Peter, 4,520,007, Cl. 424-17.000.
Goodall, Brian L., 4,520,163, Cl. 525-53.000.
Himes, Glenn R., 4,520,138, Cl. 521-91.000.
Poll, Ian; and Smit, Jacobus A. J., 4,519,321, Cl. 110-263.000.
Shepler, Eric F.: *See*—
Brush, Robert W., Sr.; and Shepler, Eric F., 4,519,661, Cl. 339-89.00M.
Sherman, Earle C.; and Green, James B. P., Jr., to Johns-Manville Corporation; and Southern Tool Company, Inc. Sleeve carton end panel and flap folding and sealing assembly. 4,519,181, Cl. 53-374.000.
Sherwood, Donald G.: *See*—
Meuschke, Robert E.; Sherwood, Donald G.; and Silverblatt, Bernard L., 4,519,519, Cl. 220-211.000.
Shibahata, Yasuji; Irie, Namio; Ikawa, Kazuo; and Akatsu, Yohsuke, to Nissan Motor Co., Ltd. Automative compliance steering control supension. 4,519,627, Cl. 280-701.000.
Shibamoto, Takeshi: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.
Shibata, Sueo: *See*—
Yamazaki, Masami; and Shibata, Sueo, 4,519,747, Cl. 416-244.00A.
Shigemura, Yutaka; Kimura, Hiroshi; Hisajima, Masahiko; Satonaka, Shinobu; Kaminaga, Seiji; and Ishito, Mitsuya, to Mita Industrial Company Limited. Apparatus for regulating the movement of a movable member. 4,519,702, Cl. 355-51.000.
Shigeta, Tatsuo, to Think Laboratory Co., Ltd. Apparatus for automatically attaching and detaching cassette-type rolls. .4,519,887, Cl. 204-212.000.
Shih, Chi-Kai: *See*—
Hagman, John F.; and Shih, Chi-Kai, 4,520,169, Cl. 525-185.000.
Shiino, Mitsuo; and Nakamura, Akio, to Shin-Etsu Polymer Co., Ltd. Socket-type connector for flat cables. 4,519,659, Cl. 339-59.00M.
Shimada, Shinichi: *See*—
Nagase, Hidenobu; Suzuki, Shigeru; and Shimada, Shinichi, 4,519,371, Cl. 123-470.000.
Shimada, Toshiyuki, to Sony Corporation. Method and apparatus for encoding an NRZI digital signal with low DC component. 4,520,346, Cl. 340-347.0DD.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,519,791, Cl. 474-152.000.
Shimizu, Hirokazu: *See*—
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,520,485, Cl. 372-48.000.
Shimizu, Hiromichi; Kuboshima, Akira; and Tanaka, Tadashi, to Daiwa Can Company, Limited. Method of multi-color printing on cylindrical container. 4,519,310, Cl. 101-35.000.
Shimizu, Isamu: *See*—
Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,519,431, Cl. 152-209.00R.
Shimizu, Kimiaki, to System Communications, Inc. Paper extractor. 4,519,911, Cl. 210-478.000.
Shimizu, Masami; Omi, Junji; Watanabe, Kunio; Uchidoi, Masanori; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Camera with printed circuit boards comprising resistance-conductor laminated constructions. 4,520,340, Cl. 338-195.000.
Shimizu, Shigehisa: *See*—
Kanaoka, Takeshi; and Shimizu, Shigehisa, 4,519,701, Cl. 355-39.000.
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Automatic transmission for vehicles. 4,519,273, Cl. 74-752.00A.
Shimotsuma, Wataru: *See*—
Soga, Mamoru; Yubakami, Keiichi; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,519,931, Cl. 252-62.510.
Shimura, Tastuo, to Hitachi, Ltd. Semiconductor integrated circuit with inversion preventing electrode. 4,520,382, Cl. 357-53.000.
Shin-Etsu Polymer Co., Ltd.: *See*—
Shiino, Mitsuo; and Nakamura, Akio, 4,519,659, Cl. 339-59.00M.
Shinn, Stuart E.: *See*—
Hulme, James H.; and Shinn, Stuart E., 4,519,478, Cl. 182-178.000.
Shinopulos, George; Randlett, M. Ronald; and Bower, Terry F., to Kennecott Corporation. Hot mill self-centering roll design. 4,519,118, Cl. 29-121.500.
Shiozaki, Takashi: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.
Shiraishi, Yoshiro, to Eiko Shiraishi. Omnidirectional drive system. 4,519,466, Cl. 180-7.100.
Shiraki, Masaru: *See*—
Hirano, Takashi; Ohashi, Shinichi; Morimoto, Satoshi; Shiraki, Masaru; Tsuda, Keishiro; Kobayashi, Tomowo; and Tsukagoshi, Shigeru, 4,520,162, Cl. 525-327.600.
Shirato, Yoshiaki: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,520,373, Cl. 346-140.00R.
Shirazawa, Takashi: *See*—
Inoue, Takeo; and Shirazawa, Takashi, 4,519,970, Cl. 264-261.000.
Shomura, Eiichi: *See*—
Takenoya, Hideaki; and Shomura, Eiichi, 4,519,328, Cl. 112-158.00E.
Shonk, Phyllis: *See*—
O'Boyle, Dolores; and Shonk, Phyllis, 4,519,137, Cl. 33-17.00R.
Shu, Si-Yan; and Tzeng, Shing-Wu P. Wheel trouble detecting and warning device. 4,520,344, Cl. 340-58.000.
Shulski, Michael M.: *See*—
Traczyk, Edward S.; and Shulski, Michael M., 4,519,232, Cl. 72-133.000.
Siano, Donald B.: *See*—
Turner, S. Richard; Siano, Donald B.; and Bock, Jan, 4,520,182, Cl. 526-307.200.
Sibral, Walter: *See*—
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,519,432, Cl. 152-357.00A.
Siebold, Horst: *See*—
Loeffler, Wilfried; Oppelt, Arnulf; and Siebold, Horst, 4,520,315, Cl. 324-309.000.
Siebourg, Wolfgang: *See*—
Dhein, Rolf; Rottmaier, Ludwig; Merten, Rudolf; and Siebourg, Wolfgang, 4,520,147, Cl. 524-100.000.
Siemens Aktiengesellschaft: *See*—
Christopher, Hans-Gunther, 4,519,861, Cl. 156-172.000.
Grosse, Joachim; Hassler, Heinrich; and Tiefel, Gunter, 4,519,234, Cl. 72-258.000.
Hohne, Karl; and Starbeck, Gerd, 4,520,081, Cl. 429-19.000.
Kusmierz, Hans, 4,519,723, Cl. 403-33.000.
Loeffler, Wilfried; Oppelt, Arnulf; and Siebold, Horst, 4,520,315, Cl. 324-309.000.
Riha, Gerd, 4,520,330, Cl. 333-195.000.
Steiger, Erwin; and Hering, Bernhard, 4,520,254, Cl. 219-121.00L.
Wessely, Herrmann, 4,520,426, Cl. 361-386.000.
Sieracki, Leonard M.: *See*—
Durkan, Gerald; and Sieracki, Leonard M., 4,519,387, Cl. 128-204.230.

SIG - Schweizerische Industrie-Gesellschaft: *See—*
Bolli, Hans-Ulrich, 4,519,495, Cl. 198-486.000.
Meier, Siegfried, 4,519,179, Cl. 53-236.000.

Sigmund, Jerry A. Pin type fastener usable with swage collar to form a joint. 4,519,736, Cl. 411-361.000.

Sikorski, James A.; and Hoobler, Mary A., to Monsanto Company. Unsymmetrical aminosulfinamide derivatives of N-phosphonomethylglycine triesters, herbicidal compositions and use. 4,519,832, Cl. 71-87.000.

Silverblatt, Bernard L.: *See—*
Meuschke, Robert E.; Sherwood, Donald G.; and Silverblatt, Bernard L., 4,519,519, Cl. 220-211.000.

Simko, Richard T., to Xicor, Inc. Integrated high voltage distribution and control systems. 4,520,461, Cl. 365-184.000.

Simmler, Lawrence W.; and Carlson, John H., to Omco Inc. Sleeve barrel lock. 4,519,225, Cl. 70-34.000.

Simmonds, Peter G.; and Moore, Robert E., to Sun Tech, Inc. Fluorocarbon tracers and tracing method. 4,520,109, Cl. 436-56.000.

Simmons, Nathaniel; Puccini, Sergio E.; Magnusson, Stig E.; and Parikh, Kamal I., to GTE Automatic Electric Inc. Space stage arrangement for a T-S-T digital switching system. 4,520,478, Cl. 370-63.000.

Simmons U.S.A. Corporation: *See—*
Dillon, Paul J.; and Stumpf, Walter, 4,519,107, Cl. 5-261.000.

Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, to Dynamit Nobel Aktiengesellschaft. Forgery-proof flat article of a synthetic resin, and process for the production thereof. 4,520,063, Cl. 428-195.000.

Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 5-Substituted-4-oxo-PGI_1 derivatives, PGI_1 compounds of similar structure, their pharmaceutical methods and process for the preparation of said compounds. 4,520,018, Cl. 514-469.000.

Simpkins, Otto K. Electronic flow meter for measuring flow of bulk solids pneumatically conveyed through a hose. 4,519,257, Cl. 73-861.040.

Singer Company, The: *See—*
Zylbert, Thaddeus J.; Fuhrmann, Wolf-Dieter; Hammer, Hans; and Kappertz, Fritz, 4,519,330, Cl. 112-222.000.

Sinner, Michael; Dietrichs, Hans-Hermann; Puls, Jurgen; Schweers, Werner; and Brachthauser, Karl-Heinz, to Bau- und Forschungsgesellschaft Thermoform AG. Process for production of sugars and optionally cellulose and lignin from lignocellulosic raw materials. 4,520,105, Cl. 435-163.000.

Siol, Werner: *See—*
Lehmann, Klaus; Dreher, Dieter; Rauch, Hubert; and Siol, Werner, 4,520,172, Cl. 525-369.000.

Sipila , Heikki; Kiuru, Erkki; and Vaijarvi, Seppo, to Outokumpu Oy. Method and apparatus for analyzing ore by means of gamma radiation. 4,520,267, Cl. 250-358.100.

Sisco, Jann L. Exercise shoe. 4,519,148, Cl. 36-91.000.

Sivyer Steel Corporation: *See—*
Ceurvorst, Kenneth, 4,519,551, Cl. 241-194.000.

Six, Jean-Claude G.; Claeys, Paul; and Guillaume, Michel, to U.S. Philips Corporation. Flame detection system with isolation between burner and electronic control device. 4,519,771, Cl. 431-25.000.

Skach, Edward J., Jr., to Dow Chemical Company, The. Rotary cooling table. 4,519,758, Cl. 425-6.000.

Skeels, Anthony J., to Xerox Corporation. Device for transferring particulate material. 4,519,693, Cl. 355-3.0DD.

Skoge, Klaus: *See—*
Montlick, Terry; Skoge, Klaus; Vetter, David C.; and Ahrens, Paul R., 4,520,499, Cl. 381-36.000.

Skopal, Judit: *See—*
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.

Skornscheck, Thomas E.: *See—*
Kramer, Fritz; Skornscheck, Thomas E.; and Strauss, Ernest, 4,519,338, Cl. 118-305.000.

Skotheim, Terji, to United States of America, Energy. Rechargeable solid polymer electrolyte battery cell. 4,520,086, Cl. 429-192.000.

Skov, Allan; and Rostrup-Nielsen, Jens R., to Haldor Topsoe. Process for the preparation of synthetic hydrocarbons. 4,520,216, Cl. 585-315.000.

Skowronek, Jerzy; and Persson, Jan O. Method for electroless copperplating and a bath for carrying out the method. 4,520,052, Cl. 427-443.100.

Skynar, Larry, to Ford Motor Company. Anti-splay shim for a two stage leaf spring assembly. 4,519,589, Cl. 267-52.000.

Slak, William M.: *See—*
Boettcher, Charles W., Jr.; Hamilton, Billy H.; Slak, William M.; and Zweig, Walter L., 4,520,437, Cl. 363-41.000.

Smalheiser, Lawrence A., to Stauffer Chemical Company. Process for absorption of SO_2 into phosphate absorbent. 4,519,994, Cl. 423-242.000.

Smeulers, Wouter: *See—*
Zwijsen, Wilhelmus A. J. M.; Duijndam, Cornelis P. J.; and Smeulers, Wouter, 4,520,393, Cl. 358-149.000.

Smit, Jacobus A. J.: *See—*
Poll, Ian; and Smit, Jacobus A. J., 4,519,321, Cl. 110-263.000.

Smit, Karlo. Ash tray having fire protecting activity. 4,520,345, Cl. 340-309.200.

Smith, Donald M., to Lubrizol Corporation, The. Sulfur-containing compounds and lubricants containing them. 4,519,925, Cl. 252-48.600.

Smith, James W., to Omnicom Engineering. Telephone line security apparatus. 4,520,233, Cl. 179-1.50R.

Smith, John W.: *See—*
Russ, James J.; Smith, John W.; and Condra, Janet S., 4,519,921, Cl. 210-716.000.

Smith, Marc L.: *See—*
Holzrichter, Edward J.; and Smith, Marc L., 4,520,188, Cl. 528-274.000.

Smith, Paul B., to Davco Manufacturing Corporation. Anti-theft lock device. 4,519,653, Cl. 303-89.000.

Smith, Stuart B., to Thermocell Development, Ltd. High-modulus, flexible urethane coating and method of preparation. 4,520,042, Cl. 427-209.000.

Smith, Thomas V., to United States of America, Army. Portable orbiting grinding machine. 4,519,169, Cl. 51-241.00S.

SMS Schloemann-Siemag AG: *See—*
Feldmann, Hugo; Hollmann, Friedrich; Beisemann, Gerd; and Gartner, Horst, 4,519,233, Cl. 72-247.000.

Snedden, William H.; and Safiuddin, Mohammed, to Westinghouse Electric Corp. Digital ramp function generator and motor drive system including the same. 4,520,450, Cl. 364-607.000.

Sneider, Vincent R. Valve control of nozzle flow from disposable syringe. 4,519,794, Cl. 604-212.000.

Snook, Randolph W., to Crown Union, Inc. Chimney lining system including frame-supported membrane. 4,519,303, Cl. 98-58.000.

Snyder Laboratories, Inc.: *See—*
Atkinson, Robert W.; Elliott, Joseph W.; and Johnson, Donald W., 4,519,385, Cl. 128-66.000.

Snyder, Solomon H.; and Gould, Robert J., to Johns Hopkins University, The. Assay method for organic calcium antagonist drugs and a kit for such an assay. 4,520,112, Cl. 436-504.000.

Societa Cavi Pirelli S.p.A.: *See—*
Borroni, Andrea, 4,519,197, Cl. 57-64.000.

Societe Anonyme des Plieuses Automatiques: *See—*
Maure, Jean, 4,519,180, Cl. 53-234.000.

Societe Anonyme Saunier Duval eau Chaude Chauffage - S.D.E.C.C.: *See—*
Boulle, Franck; and Zveguintzoff, Michel, 4,519,540, Cl. 237-7.000.

Societe d'Etudes Et Conseils A E R O: *See—*
Fourre, Remy; and de Langre, Bruno, 4,520,482, Cl. 371-68.000.

Societe Labofina S.A.: *See—*
Espitalie, Jean; Madec, Marcel; Leplat, Paul; and Paulet, Jacques, 4,519,983, Cl. 422-78.000.

Societe Nationale de l'Amiante: *See—*
Lalancette, Jean M.; Chevalier-Bultel, Jean P.; and Labonte, Normand, 4,519,811, Cl. 51-309.000.

Societe Nationale des Poudres et Explosifs: *See—*
Leneveu, Louis J. J.; and Treneules, Didier J., 4,519,855, Cl. 149-21.000.

Societe Nationale Elf Aquitaine: *See—*
Oliveau, Olivier; and Blanc, Claude, 4,519,991, Cl. 423-220.000.

Soga, Mamoru; Yubakami, Keiichi; Sonoda, Nobuo; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Magnetic fluid. 4,519,931, Cl. 252-62.510.

Sokulsky, Marvin N.: *See—*
Murphy, Richard D.; and Sokulsky, Marvin N., 4,519,626, Cl. 280-661.000.

Soletanche: *See—*
Bollinger, Karl, 4,519,475, Cl. 182-17.000.

Somfy: *See—*
Dussoliet, Jacques; and Dieupart, Michel, 4,519,554, Cl. 242-67.400.
Florin, Guy, 4,519,487, Cl. 192-36.000.

Sommer, Horst; and Gronle, Hansgeorg, to Elring Dichtungswerke GmbH. Reinforced support sheet and method for making same. 4,520,068, Cl. 428-324.000.

Sonderegger, Hans-Conrad; and Lutz, Eugen, to Kistler Instrumente A.G. High pressure transducer. 4,519,254, Cl. 73-726.000.

Sonetaka, Kazunori: *See—*
Nishino, Atsushi; Kimura, Kunio; Sonetaka, Kazunori; and Iketani, Yukiyoshi, 4,519,807, Cl. 44-15.00R.

Song, Sung T. Foldable vehicle cover storable on the vehicle. 4,519,644, Cl. 296-136.000.

Sonoda, Nobuo: *See—*
Soga, Mamoru; Yubakami, Keiichi; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,519,931, Cl. 252-62.510.

Sonoda, Takenori: *See—*
Tanaka, Masato; and Sonoda, Takenori, 4,520,407, Cl. 360-32.000.

Sonval S.A.: *See—*
Wyser, Paul-Julian, 4,520,085, Cl. 429-174.000.

Sony Corporation: *See—*
Asaida, Takashi, 4,520,386, Cl. 358-13.000.
Nakajima, Kaoru; and Miyai, Seiichi, 4,520,079, Cl. 428-694.000.
Ohshima, Eiji, 4,520,411, Cl. 360-85.000.
Shimada, Toshiyuki, 4,520,346, Cl. 340-347.0DD.
Tanaka, Masato; and Sonoda, Takenori, 4,520,407, Cl. 360-32.000.
Uedaira, Satoru; Yamanoi, Hiroshi; and Tamura, Hidemasa, 4,520,004, Cl. 423-598.000.

Sood, Lal C., to Motorola, Inc. Method and apparatus for selectively precharging column lines of a memory. 4,520,465, Cl. 365-203.000.

Sornes, Tor, to TrioVing A/S. Electronic recodeable lock. 4,519,228, Cl. 70-276.000.

Southern Tool Company, Inc.: *See—*
Sherman, Earle C.; and Green, James B. P., Jr., 4,519,181, Cl. 53-374.000.

Southwire Company: *See—*
Staib, William G., 4,519,588, Cl. 266-220.000.

Starnes, Ralph E., Jr.; and Carden, Danny P., 4,519,131, Cl. 29-825.000.
Sovonics Solar Systems: *See*—
Izu, Masatsugu; Cannella, Vincent D.; and Ovshinsky, Stanford R., 4,519,339, Cl. 118-718.000.
Ovshinsky, Stanford R., 4,520,039, Cl. 427-35.000.
Ovshinsky, Stanford R.; and Madan, Arun, 4,520,380, Cl. 357-2.000.
Soychak, Francis J.: *See*—
Chesebro, Donald G.; and Soychak, Francis J., 4,519,128, Cl. 29-576.00W.
Spaanderman Cornelis, to Internationale Octrooi Maatschappij "Octropa" B.V. Rotary weigh-sorter. 4,519,506, Cl. 209-592.000.
Spaller, Albert E., to Eastman Kodak Company. Package wind cutter. 4,519,281, Cl. 83-37.000.
Spaziante, Placido M.: *See*—
Pellegri, Alberto; and Spaziante, Placido M., 4,519,889, Cl. 204-275.000.
Specialty Packaging Products, Inc.: *See*—
Wiles, Laurence E.; and Page, Frank C., III, 4,519,518, Cl. 215-331.000.
Spector, George: *See*—
Wilhelm, Stanley R.; and Spector, George, 4,519,586, Cl. 256-51.000.
Speedfam Corporation: *See*—
Cesna, Joseph V., 4,519,168, Cl. 51-216.0LP.
Speit, Burkhard; Mennemann, Karl; and Gliemeroth, Georg, to Schott Glaswerke. High absorbance Pb-containing glass for cathode ray tube picture screen. 4,520,115, Cl. 501-60.000.
Spellar, Peter C.: *See*—
Murphy, David A.; and Spellar, Peter C., 4,519,748, Cl. 417-45.000.
Spencer, Byron A. T., to Lucas Industries Inc. Devices for controlling flow of fluid under pressure. 4,519,417, Cl. 137-501.000.
Spengler, Ernst M., to Stanztechnik GmbH R+S. Apparatus for manufacturing three-dimensional work pieces. 4,519,766, Cl. 425-302.100.
Speronello, Barry K.: *See*—
Andrews, Robert W.; Himpsl, Francis L.; Horvath, Eugene B.; and Speronello, Barry K., 4,520,119, Cl. 502-67.000.
Sperry Corporation: *See*—
Blakeslee, Edward A., 4,519,190, Cl. 56-181.000.
Kline, Charles M., 4,519,209, Cl. 60-433.000.
Liepa, Arnolds E., 4,520,439, Cl. 364-200.000.
McMahon, Donald H., 4,519,252, Cl. 73-655.000.
Webster, Emmett G.; and McLean, Kenneth W., 4,519,188, Cl. 56-16.400.
Spetra-Physics, Inc.: *See*—
Morrow, Robert J. P., 4,519,705, Cl. 356-138.000.
Spevack, Jerome S. Heat conversion system. 4,519,441, Cl. 165-1.000.
Spiess, Karl-Heinz: *See*—
Simon, Manfred; Spiess, Karl-Heinz; and Weiss, Richard, 4,520,063, Cl. 428-195.000.
Spindelfabrik Sussen, Schurr, Stahlecker & Grill GmbH: *See*—
Barauke, Norbert, 4,519,199, Cl. 57-87.000.
Spinner, Georg; Lang, Manfred; and Pautz, Anton, to Spinner GmbH, Elektrotechnische Fabrik. Light-rotation coupling for a plurality of channels. 4,519,670, Cl. 350-96.150.
Spinner GmbH, Elektrotechnische Fabrik: *See*—
Spinner, Georg; Lang, Manfred; and Pautz, Anton, 4,519,670, Cl. 350-96.150.
Spittka, Horst; Eckardt, Rudolf; and Neuendorf, Cristoph, to Flachglas Aktiengesellschaft. Method of and apparatus for quench-tempering shaped glass. 4,519,829, Cl. 65-114.000.
Square D Company: *See*—
Curran, Earl J., Jr., 4,520,304, Cl. 318-800.000.
Staar S. A.: *See*—
d'Alayer de Costemore d'Arc, Stephane, 4,520,470, Cl. 369-72.000.
Stache, Detlev: *See*—
Krautkremer, Franz; Lais, Siegfried; Knecht, Reinhold; and Stache, Detlev, 4,519,335, Cl. 114-144.00R.
Stachura, Stanley J.: *See*—
Bevilaqua, Paul M.; and Stachura, Stanley J., 4,519,990, Cl. 423-210.000.
Staffin, H. Kenneth; Roaper, Robert B.; and Bickford, Karin S., to Procedyne Corp. Method and apparatus for thermal testing. 4,519,718, Cl. 374-45.000.
Stafford, Donald C.: *See*—
Allo, Vincent F.; and Stafford, Donald C., 4,519,448, Cl. 165-118.000.
Stahlecker, Fritz, to Stahlecker, Hans, a part interest. Wrapped yarn spinning machine with several spinning places. 4,519,196, Cl. 57-18.000.
Stahlecker, Hans: *See*—
Stahlecker, Fritz, 4,519,196, Cl. 57-18.000.
Staib, William G., to Southwire Company. Molten copper oxygenation apparatus. 4,519,588, Cl. 266-220.000.
Standard Oil Company, The: *See*—
Burrington, James D.; Pesa, Fred A.; Maher, Elizabeth A.; and Grasselli, Robert K., 4,519,954, Cl. 260-465.80D.
Coffey, Gerald P.; Curatolo, Benedict S.; and Cepulis, Rimvydas L., 4,520,190, Cl. 528-336.000.
Standard Oil Company (Indiana): *See*—
Basalay, Robert J.; West, C. Thomas; and Petrille, Dennis G., 4,519,926, Cl. 252-49.600.
Chang, Yuehsiung, 4,519,881, Cl. 204-149.000.
Prater, Keith B.; Thrash, Robert J.; and Connolly, John F., 4,520,083, Cl. 429-101.000.
Tinker, Lawrence A.; and Harkness, Allan C., 4,520,084, Cl. 429-101.000.
Stants, Richard O. Method and apparatus for controlling the loads or a plurality of units on a shared source. 4,520,274, Cl. 307-39.000.
Stanztechnik GmbH R+S: *See*—
Spengler, Ernst M., 4,519,766, Cl. 425-302.100.
Starbeck, Gerd: *See*—
Hohne, Karl; and Starbeck, Gerd, 4,520,081, Cl. 429-19.000.
Starnes, Ralph E., Jr.; and Carden, Danny P., to Southwire Company. Method and apparatus for stripping multiplex wire and cable. 4,519,131, Cl. 29-825.000.
State of Israel, Ministry of Agriculture: *See*—
Loebenstein, Gad; and Gera, Abed, 4,520,020, Cl. 424-197.100.
State of Israel, Ministry of Defence, Rafael Development Authority, The: *See*—
Rosenberg, Gideon, 4,519,317, Cl. 102-521.000.
Staudinger, Gernot: *See*—
Schrofelbauer, Herbert; and Staudinger, Gernot, 4,519,995, Cl. 423-244.000.
Stauffer Chemical Co.: *See*—
Pallos, Ferenc M.; Brokke, Mervin E.; and Arneklev, Duane R., 4,519,833, Cl. 71-100.000.
Smalheiser, Lawrence A., 4,519,994, Cl. 423-242.000.
Via, Francis A., 4,519,883, Cl. 204-159.150.
Stauter, John C.: *See*—
Baldwin, Roger A.; Stauter, John C.; Kauffman, Jim W.; and Laughlin, William C., 4,519,913, Cl. 210-611.000.
Stawitz, Josef, to Bayer Aktiengesellschaft. Process for preparing 4,4'-dibenzoylaminodianthrimidecarbazole. 4,520,202, Cl. 548-416.000.
Stearley, John W.; and Woodard, Tony O., to Eaton Corporation. Pushbutton switch with remotely controlled operating attachment. 4,520,334, Cl. 335-186.000.
Steelcase, Inc.: *See*—
Whitwam, Ronald L., 4,519,651, Cl. 297-455.000.
Steidel, Clinton F., to Transco Products, Inc. Rotary actuator for a microwave switch. 4,520,331, Cl. 335-125.000.
Steigauf, William A. Apparatus for driving nails using an impact hammer. 4,519,536, Cl. 227-147.000.
Steiger, Erwin; and Hering, Bernhard, to Siemens Aktiengesellschaft. Method and apparatus for the adjustment of contact springs in a relay. 4,520,254, Cl. 219-121.00L.
Steimel, Johannes: *See*—
Seeger, G. Hans J.; Giesenberg, Peter; and Steimel, Johannes, 4,519,291, Cl. 89-1.806.
Steiner, Hakan: *See*—
Hultmark, Dan; Steiner, Hakan; Rasmuson, Torgny; and Boman, Hans G., 4,520,016, Cl. 514-12.000.
Steinle, Benedikt: *See*—
Petr, Jan; and Steinle, Benedikt, 4,520,311, Cl. 324-117.00R.
Stenzenberger, Horst, to Boots Company PLC, The. Modified thermosetting imide resins with improved fracture toughness. 4,520,145, Cl. 523-500.000.
Sternson Limited: *See*—
Tosh, Douglas J., 4,520,185, Cl. 528-65.000.
Stevens, David P.: *See*—
DeYoreo, Sal G.; and Stevens, David P., 4,519,776, Cl. 431-328.000.
Stevens, Samuel B.: *See*—
Satzler, Ronald L.; and Stevens, Samuel B., 4,519,654, Cl. 305-27.000.
Stevens, Timothy S.; and Langhorst, Martin A., to Dow Chemical Company, The. High performance analytical column for anion determination. 4,519,905, Cl. 210-198.200.
Stevens, William D.: *See*—
Paredes, Candelario; and Stevens, William D., 4,520,390, Cl. 358-108.000.
Stevenson, Michael J. Method for use of pattern transfers in rotomolding. 4,519,972, Cl. 264-245.000.
Stewart-Warner Corporation: *See*—
Mayer, William; and Runions, Alton E., 4,520,432, Cl. 362-267.000.
Stichting Nederlands Instituut Voor Zuivelonderzoek: *See*—
Ottenhof, Henricus A. W. E. M., 4,519,945, Cl. 260-119.000.
Stier, Kenneth. Slats for vertical venetian blinds. 4,519,435, Cl. 160-166.00A.
Stisen, Borge. Straw fuel briquette press. 4,519,808, Cl. 44-10.00A.
Stobb, Inc.: *See*—
Stobb, Walter J., 4,519,740, Cl. 414-71.000.
Stobb, Walter J., to Stobb, Inc. Apparatus and method for palletizing bundles of sheets. 4,519,740, Cl. 414-71.000.
Stol, Israel. Surface-fastened frangible adhesive capsule. 4,519,866, Cl. 156-295.000.
Stoll, Kurt. Solenoid valve. 4,519,421, Cl. 137-596.160.
Stoll, Kurt; and Glattli, Hans-Heinrich. Adapter block and a mold for producing such blocks by foam molding. 4,520,061, Cl. 428-137.000.
Stolpen, Alan H.: *See*—
Kelly, Austin T.; Stolpen, Alan H.; and Emile, Philip, Jr., 4,520,310, Cl. 324-115.000.
Stone, Albert; Pyde, Edwin; and Carveth, Peter, to Baxter Travenol Laboratories, Inc. Container having a selectively openable seal line and peelable barrier means. 4,519,499, Cl. 206-219.000.
Stone, Gary H.: *See*—
Stone, Joel R.; and Stone, Gary H., 4,519,631, Cl. 283-70.000.
Stone, Joel R.; and Stone, Gary H. System for providing updated product and pricing information for retailer. 4,519,631, Cl. 283-70.000.

Straubel, Max: *See—*
Eheim, Franz; Hofer, Gerald; Konrath, Karl; and Straubel, Max, 4,519,352, Cl. 123-373.000.

Strauss, Ernest: *See—*
Kramer, Fritz; Skornscheck, Thomas E.; and Strauss, Ernest, 4,519,338, Cl. 118-305.000.

Straw, Robert D.: *See—*
Yannopoulos, Lymperios N.; Straw, Robert D.; and Philips, D. Colin, 4,520,157, Cl. 524-462.000.

Street, Kenneth: *See—*
Brotherton, William A.; and Street, Kenneth, 4,520,427, Cl. 361-389.000.

Strickland, James K.; and Ivey, H. Grady, to Strickland Systems, Inc. Inside corner concrete form unit. 4,519,570, Cl. 249-194.000.

Strickland Systems, Inc.: *See—*
Strickland, James K.; and Ivey, H. Grady, 4,519,570, Cl. 249-194.000.

Strid, Kent: *See—*
Ragnegard, Samuel; Strid, Kent; and Sundkvist, Goran, 4,519,910, Cl. 210-327.000.

Strohmaier, Ernst; Reich, Heinrich; and Wagner, Bernd, to Kaltenbach & Voigt GmbH & Co. Dental handpiece. 4,519,780, Cl. 433-29.000.

Strohmayer, Herbert F.: *See—*
Schmidt, Andreas R.; Strohmayer, Herbert F.; Sibral, Walter; and Milligan, Barton, 4,519,432, Cl. 152-357.00A.

Stryer, Lubert; Glazer, Alexander N.; and Oi, Vernon T., to Leland Stanford Junior University, The Board of Trustees of the. Fluorescent immunoassay employing a phycobiliprotein labeled ligand or receptor. 4,520,110, Cl. 436-501.000.

Stuart, James M., to Malvern Scale Company. Weighing scale with adjustable suspension and thermal compensation. 4,519,464, Cl. 177-244.000.

Stucke, Walter: *See—*
Landgraf, Helmut; and Stucke, Walter, 4,519,863, Cl. 156-244.120.

Stuckey, William C. Vertical plant support with horizontal hoops. 4,519,162, Cl. 47-47.000.

Studt, William L.: *See—*
Campbell, Henry F.; Kuhla, Donald E.; Studt, William L.; and Dodson, Stuart A., 4,520,025, Cl. 514-275.000.

Stumpf, Walter: *See—*
Dillon, Paul J.; and Stumpf, Walter, 4,519,107, Cl. 5-261.000.

Submicron, Inc.: *See—*
Czerlinski, George H., 4,520,249, Cl. 219-10.49R.

Subramanian, Narayanan S., to Du Pont de Nemours, E. I., and Company. Process for making random ethylene/alkyl acrylate copolymers. 4,520,183, Cl. 526-318.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co.: *See—*
Nonnenmann, Manfred; Hesse, Wolfgang; Haller, Klaus; and Bardong, Helmut, 4,519,120, Cl. 29-157.00R.

Suga, Shigeru. Device for testing combustability. 4,519,716, Cl. 374-8.000.

Sugahara, Kenshi; Yasuda, Kazuo; and Mori, Junji, to Hitachi, Ltd. Liquid film type, anion-selective electrode. 4,519,891, Cl. 204-418.000.

Sugihara, Hiroshi: *See—*
Saito, Seitoku; Izumi, Toshiaki; Kobuke, Takayoshi; and Sugihara, Hiroshi, 4,520,076, Cl. 428-611.000.

Sugihara, Takashi: *See—*
Miyoshi, Shuji; Sugihara, Takashi; Jinda, Akihito; and Hijikigawa, Masaya, 4,520,341, Cl. 338-35.000.

Suginaka, Shunji: *See—*
Kobayashi, Tatsuhiko; Ikeuchi, Satoru; Watanabe, Kazumasa; and Suginaka, Shunji, 4,520,095, Cl. 430-223.000.

Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, to Matsushita Electric Industrial Co., Ltd. Semiconductor device. 4,520,485, Cl. 372-48.000.

Sugiura, Tsutomu: *See—*
Bunno, Masayasu; Sugiura, Tsutomu; Tsuji, Masao; Harada, Hidemi; and Ichihara, Yoshihiro, 4,520,102, Cl. 435-61.000.

Sugiyama, Hiroyuki; Abe, Ryozo; Yusa, Yasuhiro; Sakurai, Masaki; and Yoshihara, Kenji, to Victor Company of Japan, Ltd. Signal pickup device in a rotary recording medium reproducing apparatus. 4,520,473, Cl. 369-126.000.

Sugiyama, Hiroyuki: *See—*
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Suh, John T.: *See—*
Loev, Bernard; Jones, Howard; and Suh, John T., 4,520,131, Cl. 514-156.000.

Sukumar, Subramaniam: *See—*
Hall, Laurance D.; and Sukumar, Subramaniam, 4,520,316, Cl. 324-309.000.

Sullivan, Ashley H. Mouth splint. 4,519,386, Cl. 128-136.000.

Sulzer Brothers Limited: *See—*
Meier, Bruno, 4,519,272, Cl. 74-752.00R.
Schreiber, Adam; and Hilaire, Jacob, 4,519,101, Cl. 3-1.912.

Sulzer-Escher Wyss Ltd.: *See—*
Oertle, Jakob; and Mulhaupt, Bruno, 4,519,899, Cl. 208-179.000.

Sumida, Shizuo: *See—*
Nagaoka, Mitsuru; Oda, Kazuya; and Sumida, Shizuo, 4,519,484, Cl. 192-3.580.

Sumino, Yoichi, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic diagnosis apparatus using reduced numbers of photo transmission lines. 4,519,250, Cl. 73-626.000.

Sumitomo Chemical Co., Ltd.: *See—*
Hattori, Makoto; Taguma, Akihiro; Morimitsu, Toshihiko; and Takeshita, Akira, 4,519,947, Cl. 260-371.000.

Sumner, Leslie, to Gallaher Limited. Material handling device. 4,519,298, Cl. 92-103.00F.

Sun Tech, Inc.: *See—*
Hsu, Chao-Yang; and Lyons, James E., 4,519,948, Cl. 260-396.00R.
Simmonds, Peter G.; and Moore, Robert E., 4,520,109, Cl. 436-56.000.

Sunbelt Plastics, A Division Of Sunbelt Manufacturing, Inc.: *See—*
Jackson, John C., II; and Schendle, Robert N., 4,519,502, Cl. 206-390.000.

Sundet, Sherman A., to Du Pont de Nemours, E. I., and Company. Production of composite membranes. 4,520,044, Cl. 427-244.000.

Sundkvist, Goran: *See—*
Ragnegard, Samuel; Strid, Kent; and Sundkvist, Goran, 4,519,910, Cl. 210-327.000.

Sundstrand Corporation: *See—*
Glennon, Timothy F., 4,520,279, Cl. 307-254.000.

Sunny H. K.: *See—*
Minet, Ronald G.; Dente, Mario; Ranzi, Eliseo; and Sunny H. K., 4,520,217, Cl. 585-415.000.

Supreme Aluminum Industries Limited: *See—*
Hulme, James H.; and Shinn, Stuart E., 4,519,478, Cl. 182-178.000.

Susi, Roger E. Reset circuit. 4,520,418, Cl. 361-92.000.

Sutcliffe, John W., to United Technologies Corporation. Method for the machining of composite materials. 4,519,732, Cl. 408-1.00R.

Sutherland, Donald. Playground carrousel. 4,519,602, Cl. 272-33.00R.

Sutherland, Ray, to Rockwell International Corporation. Tamperproof, moisture proof readout enclosure. 4,520,423, Cl. 361-380.000.

Sutoh, Shinji; Hara, Toshizo; and Takahashi, Akiyoshi, to Diesel Kiki Kabushiki Kaisha. Window pane defroster device with vehicle air conditioning apparatus. 4,519,443, Cl. 165-17.000.

Sutton, David L.; and Walker, Michael L., to Halliburton Company. Environmentally compatible high density drill mud or blow-out control fluid. 4,519,922, Cl. 252-8.50B.

Suzuki, Fujio: *See—*
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Suzuki, Hayao, to Kabushiki Kaisha Daini Seikosha. Controlling apparatus for positioning. 4,520,301, Cl. 318-609.000.

Suzuki, Hiroaki: *See—*
Sasaki, Itsuo; and Suzuki, Hiroaki, 4,520,283, Cl. 307-520.000.

Suzuki, Hiroshi: *See—*
Yoshida, Jituo; Okuyama, Shigeaki; and Suzuki, Hiroshi, 4,519,193, Cl. 56-328.00R.

Suzuki, Ryoichi: *See—*
Momiyama, Kikuo; Uchiyama, Takashi; Suzuki, Ryoichi; Murakami, Hiroyasu; Kawamura, Masaharu; and Sakai, Shinji, 4,519,685, Cl. 354-154.000.

Suzuki, Shigeru: *See—*
Nagase, Hidenobu; Suzuki, Shigeru; and Shimada, Shinichi, 4,519,371, Cl. 123-470.000.

Suzuki, Shigeto: *See—*
Schroeder, Albert H.; Denisevich, Peter, Jr.; Suzuki, Shigeto; and Kurkov, Victor P., 4,519,940, Cl. 252-500.000.

Suzuki, Shigeyoshi: *See—*
Senga, Takao; Yamada, Jun; and Suzuki, Shigeyoshi, 4,520,088, Cl. 430-49.000.

Suzuki, Toshinori; and Ozawa, Minoru. Video tape recorder with record review mode for editing signals recorded on magnetic tape. 4,520,406, Cl. 360-14.200.

Swanson, Carl I., to Kidde, Inc. Multiple redundant suppression devices with provision of supervision and fault correction. 4,520,348, Cl. 340-508.000.

Swindler, Dan E., to Texas Instruments Incorporated. Four-way key switch control mechanism. 4,520,240, Cl. 200-5.00R.

SWS Silicones Corporation: *See—*
Martin, Eugene R.; Ansel, David S.; and Manis, Paul A., 4,520,176, Cl. 524-598.000.

Sxoma-Energie: *See—*
Redele, Jean E. A., 4,519,358, Cl. 123-557.000.

Sychev, Anatoly P.; Sannikov, Jury I.; Grinin, Jury A.; Polyakov, Ivan P.; and Abdeev, Jury M., to Vsesojuzny Nauchno-Issledovatelsky Institut Tsvetnoi Metallurgii. Method of processing lead sulphide or lead-zinc sulphide ores, or sulphide concentrates, or mixtures thereof. 4,519,836, Cl. 75-25.000.

Sycon Corporation: *See—*
Kelly, Austin T.; Stolpen, Alan H.; and Emile, Philip, Jr., 4,520,310, Cl. 324-115.000.

Synthelabo: *See—*
Cavero, Icilio; and Langer, Salomon, 4,520,030, Cl. 514-629.000.

System Communications, Inc.: *See—*
Shimizu, Kimiaki, 4,519,911, Cl. 210-478.000.

Szabo, Laszlo. Portable lawn and garden sprinkler system. 4,519,544, Cl. 239-279.000.

Szabo Maschinenbau GmbH & Co. KG: *See—*
Schlienkamp, Hubert, 4,519,962, Cl. 264-40.700.

Szczepanski, Henry, to Ciba-Geigy Corporation. Herbicidal ethynylphenylureas. 4,519,834, Cl. 71-100.000.

Szilagyi, Ildiko : *See—*
Simonidesz, Vilmos; Ivanics, Jozsef; Galambos, Geza; Papp nee Behr, Agnes; Kovacs, Gabor; Skopal, Judit; and Szilagyi, Ildiko , 4,520,018, Cl. 514-469.000.

Szuminski, Gary F.; and Jones, Thomas J., to Rolls-Royce Inc.; and Rolls-Royce Limited. Vectorable nozzles for turbomachines. 4,519,543, Cl. 239-265.190.

Tabak, Samuel A.: *See*—
Owen, Hartley; Tabak, Samuel A.; and Wright, Bernard S., 4,520,215, Cl. 585-255.000.

Tabata, Junichi, to Kabushiki Kaisha Daini Seikosha. Pulse detector. 4,519,397, Cl. 128-706.000.

Tabuchi, Hiroshi: *See*—
Oshima, Masanao; Narita, Hitoshi; Yashima, Nobuyoshi; and Tabuchi, Hiroshi, 4,519,728, Cl. 405-224.000.

Tachikawa Spring Co.: *See*—
Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichirou; Hayashi, Koji; and Kon, Shigeki, 4,519,862, Cl. 156-219.000.

Tada, Satomi: *See*—
Kumasaka, Sadao; and Tada, Satomi, 4,520,141, Cl. 521-126.000.

Tagliafico, Carlo, to Costruzioni Elettromagnetiche Industriali di Tagliafico Carlo. Solenoid with internally located switch contacts. 4,520,332, Cl. 335-126.000.

Taguchi, Shunichi: *See*—
Ishihara, Masahiro; Watanabe, Mitsuru; Ohkawa, Shuji; Taguchi, Shunichi; and Kikuchi, Itsuo, 4,520,250, Cl. 219-10.55B.

Taguma, Akihiro: *See*—
Hattori, Makoto; Taguma, Akihiro; Morimitsu, Toshihiko; and Takeshita, Akira, 4,519,947, Cl. 260-371.000.

Taiho Kogyo Co., Ltd.: *See*—
Kutsuna, Tomoharu; Ohtani, Shinzi; and Kondo, Kunimasa, 4,520,045, Cl. 427-294.000.

Taiyo Yuden Co., Ltd.: *See*—
Yamaoka, Nobutatsu; Tsukada, Akira; and Sasazawa, Kazuo, 4,519,942, Cl. 252-520.000.

Takabayashi, Katsuyuki: *See*—
Nagasawa, Takeshi; Kuroiwa, Katsumasa; and Takabayashi, Katsuyuki, 4,520,100, Cl. 435-13.000.

Takagi, Satoshi: *See*—
Itoh, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,519,269, Cl. 74-483.00R.

Takahashi, Akiyoshi: *See*—
Sutoh, Shinji; Hara, Toshizo; and Takahashi, Akiyoshi, 4,519,443, Cl. 165-17.000.

Takahashi, Fuminobu: *See*—
Hori, Yuji; Nishimura, Yoshichika; and Takahashi, Fuminobu, 4,519,923, Cl. 252-8.50C.

Takahashi, Hiroshi, to Nippon Electric Co., Ltd. Digital television special effect waveform generator. 4,520,398, Cl. 358-183.000.

Takahashi, Kotei, to Nissan Motor Company, Limited. Automotive manual transmission. 4,519,267, Cl. 74-473.00R.

Takahashi, Naoyuki: *See*—
Kamimura, Yoshihiko; Okamoto, Toshiro; Takahashi, Naoyuki; Makihara, Hiroshi; and Oshima, Michio, 4,520,224, Cl. 585-648.000.

Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, to Victor Company of Japan, Ltd. Digital video signal recording system and reproducing apparatus. 4,520,401, Cl. 358-310.000.

Takahashi, Susumu, to Niigata Engineering Co., Ltd. Emergency disconnector for fluid loading and unloading lines. 4,519,411, Cl. 137-68.00R.

Takahashi, Susumu: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,519,690, Cl. 354-324.000.

Takai, Kazuki: *See*—
Itoh, Yukio; Takai, Kazuki; and Takagi, Satoshi, 4,519,269, Cl. 74-483.00R.

Takamatsu, Shuhei: *See*—
Fujimoto, Michitaro; Ohde, Hironori; Seki, Hirokazu; Takamatsu, Shuhei; and Sakai, Takeshi, 4,520,201, Cl. 548-342.000.

Takamiya, Bonnosuke: *See*—
Shimizu, Takeo; Hiramatsu, Takeo; Takamiya, Bonnosuke; and Fukuchi, Hiroshi, 4,519,273, Cl. 74-752.00A.

Takano, Osamu; and Fujiwara, Koji, to Kabushiki Kaisha Takuma. Velocity controlling apparatus and method to be used with a stoker type burning apparatus. 4,519,323, Cl. 110-281.000.

Takasago Perfumery Co., Ltd.: *See*—
Mitsuhashi, Shigeru; Kumobayashi, Hidenori; and Akutagawa, Susumu, 4,520,212, Cl. 568-875.000.

Takashi, Takano: *See*—
Sasaki, Akihiko; Arai, Kouji; Takashi, Takano; and Namiki, Yasuomi, 4,520,405, Cl. 360-10.300.

Takashi, Takuma: *See*—
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, 4,519,839, Cl. 75-242.000.

Takashima, Seiichi: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Takatori, Yasushi: *See*—
Ayata, Naoki; Shirato, Yoshiaki; Takatori, Yasushi; and Seki, Mitsuaki, 4,520,373, Cl. 346-140.00R.

Takeda Chemical Industries, Ltd.: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,520,194, Cl. 544-22.000.

Takeda, Hiroaki; Tanaka, Kano; and Murata, Shinji, to Canon Kabushiki Kaisha. Image forming apparatus. 4,519,697, Cl. 355-14.00R.

Takeda, Kazutoshi: *See*—
Kamata, Nobuo; Sekiya, Takashi; Takeda, Kazutoshi; Hayasaka, Toyoo; and Yoshida, Tomohisa, 4,520,087, Cl. 429-219.000.

Takenaka, Akihiko: *See*—
Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.

Takenaka Komuten Co., Ltd.: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Takenoya, Hideaki; and Shomura, Eiichi, to Janome Sewing Machine Co., Ltd. Electronic sewing machine with control detecting device. 4,519,328, Cl. 112-158.00E.

Takeshita, Akira: *See*—
Hattori, Makoto; Taguma, Akihiro; Morimitsu, Toshihiko; and Takeshita, Akira, 4,519,947, Cl. 260-371.000.

Takeuchi, Tatsuro; Yoshida, Shohei; and Kawai, Kazuhiro. Gas-liquid contacting apparatus. 4,519,959, Cl. 261-93.000.

Takeuchi, Toshio: *See*—
Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, 4,519,690, Cl. 354-324.000.

Talsma, Robert C.: *See*—
Kosrow, Robert L.; and Talsma, Robert C., 4,519,331, Cl. 112-262.300.

Tamaki, Kiyoshi: *See*—
Yamazaki, Hiroshi; and Tamaki, Kiyoshi, 4,520,090, Cl. 430-106.600.

Tambo, William: *See*—
Coleman, Larry M.; and Tambo, William, 4,519,999, Cl. 423-337.000.

Tamura, Hidemasa: *See*—
Uedaira, Satoru; Yamanoi, Hiroshi; and Tamura, Hidemasa, 4,520,004, Cl. 423-598.000.

Tamura, Raymond M. Pollution reducing aircraft propulsion. 4,519,563, Cl. 244-208.000.

Tan, Sing L.: *See*—
Jackson, Richard N.; and Tan, Sing L., 4,520,385, Cl. 358-12.000.

Tanabe Seiyaku Co., Ltd.: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,519,955, Cl. 260-501.120.

Tanahashi, Toru, to Mitsubishi Denki Kabushiki Kaisha. Safety apparatus for elevator. 4,519,479, Cl. 187-29.00R.

Tanaka, Akio. Apparatus and method for the combustion of water-in-oil emulsion fuels. 4,519,769, Cl. 431-4.000.

Tanaka, Kano: *See*—
Takeda, Hiroaki; Tanaka, Kano; and Murata, Shinji, 4,519,697, Cl. 355-14.00R.

Tanaka, Katsushi: *See*—
Murai, Toshio; Aoyagi, Hayao; Furukawa, Masahiko; Yamada, Hiromichi; Kawamura, Tateo; Ishikawa, Yoshihiro; Sakamoto, Akio; Tsuchiya, Toshiaki; Shiozaki, Takashi; Kubota, Hirokuni; Okada, Isoji; Ishii, Jiro; Fujii, Fumio; Nagao, Masakazu; Kikuchi, Masamitsu; Ishii, Morio; Sasaki, Yoshimasa; Tanaka, Katsushi; and Itakura, Tadashi, 4,519,768, Cl. 425-456.000.

Tanaka, Koji: *See*—
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Tanaka, Masato; and Sonoda, Takenori, to Sony Corporation. Recording and/or reproducing apparatus for a multi-channel digital signal. 4,520,407, Cl. 360-32.000.

Tanaka, Osamu; Iijima, Hiroshi; Ito, Masayoshi; and Okigawa, Etsumi, to Kanagawa Rehabilitation Center. Wheelchair. 4,519,649, Cl. 297-316.000.

Tanaka, Shigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. Failure detection circuit for an X-ray tube. 4,520,495, Cl. 378-117.000.

Tanaka, Tadashi: *See*—
Shimizu, Hiromichi; Kuboshima, Akira; and Tanaka, Tadashi, 4,519,310, Cl. 101-35.000.

Tanaka, Takashi: *See*—
Ono, Yoshio; and Tanaka, Takashi, 4,519,337, Cl. 118-33.000.

Tanaka, Takumi: *See*—
Arai, Yoshihiro; and Tanaka, Takumi, 4,520,174, Cl. 525-438.000.
Arai, Yoshihiro; and Tanaka, Takumi, 4,520,175, Cl. 525-438.000.

Tanaka, Yoshikazu: *See*—
Yamamuro, Sigeaki; Hirano, Hiroyuki; Morimoto, Yoshiro; and Tanaka, Yoshikazu, 4,519,790, Cl. 474-18.000.

Taniguchi, Itaru: *See*—
Fujii, Yoshihiko; Tomita, Osamu; Taniguchi, Itaru; and Saiwai, Kazuhiko, 4,520,370, Cl. 346-76.00L.

Taniguchi, Masato: *See*—
Umeda, Tadashi; Miyoshi, Hideo; Kishimoto, Keiichi; Iida, Kazumi; Akiyama, Kazunori; Abe, Yuji; and Taniguchi, Masato, 4,520,354, Cl. 340-679.000.

Taniguchi, Tsutomu: *See*—
Sato, Ryuichi; Taniguchi, Tsutomu; and Ohba, Masatoshi, 4,520,289, Cl. 310-316.000.

Tanner Companies, The: *See*—
Gillen, Orval D.; and Healey, John G., Jr., 4,519,711, Cl. 366-4.000.

Tao, Muneo; and Migaki, Fumihiko, to Matsushita Electric Industrial Co., Ltd. Burner apparatus. 4,519,775, Cl. 431-344.000.

Tarng, Ming L.; and Romito, William S., to RCA Corporation. Method for determining the integrity of passivant coverage over rectifying junctions in semiconductor devices. 4,520,312, Cl. 324-158.00D.

Taylor, Brian E.: *See—*
Lindstrom, Gerald D.; Eckhart, Clifford F.; Farthing, George A., Jr.; Muckley, James J.; and Taylor, Brian E., 4,519,322, Cl. 110-264.000.

Taylor, Mark P.: *See—*
Beall, George H.; MacDowell, John F.; and Taylor, Mark P., 4,519,828, Cl. 65-33.000.

Taylor, Ronald P.; Cekoric, Mark E.; Dewhurst, John E.; and Abouzahr, Saad M., to Mobay Chemical Corporation. Internal mold release agent for use in reaction injection molding. 4,519,965, Cl. 264-51.000.

Taylor, Thomas E. Fireplace heat transfer apparatus. 4,519,377, Cl. 126-121.000.

Tazuki, Shoji; and Toyama, Koji, to Mitsubishi Paper Mills, Ltd. Electrophotographic offset masters. 4,520,089, Cl. 430-49.000.

TDK Electronics Co., Ltd.: *See—*
Saito, Seitoku; Izumi, Toshiaki; Kobuke, Takayoshi; and Sugihara, Hiroshi, 4,520,076, Cl. 428-611.000.

Team, Inc.: *See—*
Harrison, George W., 4,520,051, Cl. 427-387.000.

Tecumseh Products Company: *See—*
Hermanson, William O., 4,519,486, Cl. 192-3.00S.

Tefft, Ronald E.: *See—*
Worrall, James D.; and Tefft, Ronald E., 4,520,059, Cl. 428-109.000.

Teichman, Robert L.: *See—*
Bernhard, Dennis P.; Rowles, Howard C.; and Teichman, Robert L., 4,519,825, Cl. 62-28.000.

Tekcast Industries, Inc.: *See—*
Schaer, Leonard S., 4,519,971, Cl. 264-311.000.

Tekken Construction Co., Ltd.: *See—*
Horimatsu, Kazuo, 4,519,730, Cl. 405-258.000.

Tektronix, Inc.: *See—*
Hoffman, Gilbert A., 4,520,325, Cl. 330-302.000.
Mitch, John H., 4,520,355, Cl. 340-709.000.

Telecommunications Radioelectriques et Telephoniques T. R. T.: *See—*
Raulin, Jean M.; and Bonnerot, Georges, 4,520,491, Cl. 375-27.000.

Teleflex Morse Limited: *See—*
Hemens, James F., 4,519,294, Cl. 91-374.000.

Terada, Takami; Nawa, Hiroshi; and Kawamura, Reiki, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kabushiki Kaisha. Seat back frame assembly for automobile seats. 4,519,650, Cl. 297-452.000.

Testore, Guido, to ORMIG S.p.A. Mobile yard crane for handling containers. 4,519,741, Cl. 414-738.000.

Teutsch, Jean G.; Costerousse, Germain; Philibert, Daniel; and Deraedt, Roger, to Roussel Uclaf. Steroids. 4,519,946, Cl. 260-239.55R.

te Velde, Ties S., to U.S. Philips Corporation. Passive display device. 4,519,676, Cl. 350-269.000.

Texaco Inc.: *See—*
Davis, Lorne A., Jr.; and Haskin, Helen K., 4,519,982, Cl. 422-68.000.
Lin, Jiang-Jen; and Duranleau, Roger G., 4,519,956, Cl. 260-549.000.
Mott, George E.; and Levert, Frederick J., Jr., 4,519,725, Cl. 405-195.000.

Texaco Limited: *See—*
Knowles, John P.; Wheeler, Steven A.; and Mitchell, Stewart D., 4,519,726, Cl. 405-195.000.
Mitchell, Stewart D.; and Wheeler, Steven A., 4,519,727, Cl. 405-204.000.

Texas Eastern Engineering Ltd.: *See—*
Buls, Ronald L.; and Gilcrease, James P., 4,519,815, Cl. 55-46.000.

Texas Instruments Incorporated: *See—*
Hahn, Larry A., 4,520,277, Cl. 307-252.00C.
Swindler, Dan E., 4,520,240, Cl. 200-5.00R.

Th. Goldschmidt AG: *See—*
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.

Thaler, Warren A.: *See—*
Peiffer, Dennis G.; Lundberg, Robert D.; Duvdevani, Ilan; and Thaler, Warren A., 4,520,158, Cl. 524-481.000.

The, Paul J.: *See—*
Pearson, Alan; and The, Paul J., 4,519,989, Cl. 423-121.000.

Theis, Ulrich: *See—*
Bethmann, Karl W.; and Theis, Ulrich, 4,519,316, Cl. 102-513.000.

Thermo Electron Corporation: *See—*
Lee, Chung H.; Fronduto, John; and Oettinger, Peter E., 4,519,876, Cl. 204-15.000.

Thermo King Corporation: *See—*
Barnett, Joe R., 4,519,215, Cl. 62-158.000.

Thermocell Development, Ltd.: *See—*
Smith, Stuart B., 4,520,042, Cl. 427-209.000.

Thielenhaus, Ernst, to Ernst Thielenhaus KG. Method of and apparatus for holding a shaft during finish grinding. 4,519,170, Cl. 51-289.00R.

Think Laboratory Co., Ltd.: *See—*
Shigeta, Tatsuo, 4,519,887, Cl. 204-212.000.

Thiokol Corporation: *See—*
Inman, Frank S.; Giedt, Donald C.; and Lushis, Donald V., 4,519,290, Cl. 87-7.000.

Thomas & Betts Corporation: *See—*
Biswas, Ranjit, 4,519,658, Cl. 339-17.0CF.

Thomas, Leslie P., to Diamond Automations, Inc. Egg transfer system. 4,519,505, Cl. 209-513.000.

Thomas, Leslie P.: *See—*
McEvoy, John C.; and Thomas, Leslie P., 4,519,494, Cl. 198-448.000.

Thomas, Ralph H., Sr.: *See—*
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,519,514, Cl. 215-225.000.

Thompson, J. Brent: *See—*
Mitchell, William A.; Thompson, J. Brent; and Freese, John L., 4,519,734, Cl. 409-231.000.

Thomson-CSF: *See—*
Grimberg, Martine; and Berard, Alain, 4,520,442, Cl. 364-414.000.
Huignard, Jean-Pierre; and Malard, Marcel, 4,520,484, Cl. 372-24.000.

Thomson, David S.: *See—*
Marsham, Peter R.; and Thomson, David S., 4,520,027, Cl. 514-354.000.

Thorsett, Eugene D.: *See—*
Harris, Elbert E.; and Thorsett, Eugene D., 4,520,021, Cl. 514-212.000.

Thrash, Robert J.: *See—*
Prater, Keith B.; Thrash, Robert J.; and Connolly, John F., 4,520,083, Cl. 429-101.000.

Tiberg, Lars: *See—*
Fredriksson, Hasse; and Tiberg, Lars, 4,519,439, Cl. 164-476.000.

Tiefel, Gunter: *See—*
Grosse, Joachim; Hassler, Heinrich; and Tiefel, Gunter, 4,519,234, Cl. 72-258.000.

Tillotson, John D., to Elco Corporation. Multipin connector and method of reducing EMI by use thereof. 4,519,664, Cl. 339-143.00R.

Timms, Richard H., to Rohr Industries, Inc. Aircraft thrust reverser mechanism. 4,519,561, Cl. 244-110.00B.

Timoschuk, Walter. Universal cable winding drum. 4,519,556, Cl. 242-117.000.

Tinker, Lawrence A.; and Harkness, Allan C., to Standard Oil Company (Indiana). Etched metal electrodes and their use in nonaqueous electrochemical cells. 4,520,084, Cl. 429-101.000.

Tinoco, Edward N.: *See—*
Ishimitsu, Kichio K.; and Tinoco, Edward N., 4,519,560, Cl. 244-45.00R.

Tochikubo, Osamu: *See—*
Torii, Yoshihiko; and Tochikubo, Osamu, 4,519,248, Cl. 73-223.000.

Toda, Takao: *See—*
Kashiwagi, Kazuo; and Toda, Takao, 4,519,694, Cl. 355-5.000.

Todd, Elizabeth A.: *See—*
Reusser, Robert E.; Kenton, Joseph R.; and Todd, Elizabeth A., 4,520,222, Cl. 585-526.000.

Todokoro, Shigeru; Nakane, Hiroshi; and Maeda, Satoru, to Tokyo Shibaura Denki Kabushiki Kaisha. Tracking servo system for optical-disc information reproducing apparatus. 4,520,469, Cl. 369-44.000.

Tokaichi, Tetsuro: *See—*
Ichimura, Yoshiaki; Noda, Atsuhito; Tokaichi, Tetsuro; and Umesato, Shoji, 4,519,660, Cl. 339-75.00M.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Abe, Takahiko, 4,520,395, Cl. 358-163.000.
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,520,041, Cl. 427-88.000.
Arai, Kazuhiro, 4,519,127, Cl. 29-571.000.
Arita, Masataka; and Matsubara, Mitsuyoshi, 4,520,494, Cl. 378-108.000.
Ishii, Akira, 4,519,255, Cl. 73-727.000.
Kohyama, Mitsuaki; and Toshimitsu, Kenshi, 4,519,698, Cl. 355-15.000.
Komatsubara, Yoshiaki; Ide, Kyozoh; and Munakata, Eiko, 4,519,678, Cl. 350-338.000.
Nara, Seietsu, 4,520,447, Cl. 364-478.000.
Ohba, Hiroshi; and Horino, Shigeo, 4,519,523, Cl. 221-129.000.
Sano, Tetsuo; Orita, Susumu; Yamazaki, Masaya; and Moriyama, Kazuhiro, 4,519,214, Cl. 62-156.000.
Sumino, Yoichi, 4,519,250, Cl. 73-626.000.
Tanaka, Shigeru, 4,520,495, Cl. 378-117.000.
Todokoro, Shigeru; Nakane, Hiroshi; and Maeda, Satoru, 4,520,469, Cl. 369-44.000.
Watanabe, Junji, 4,519,601, Cl. 271-114.000.
Yokoyama, Hideo; Tomita, Seiji; and Yamada, Shigeo, 4,519,558, Cl. 242-186.000.

Tokyo Shibaura Kenki Kabushiki Kaisha: *See—*
Iida, Kazuhiko, 4,520,399, Cl. 358-287.000.

Tomisawa, Yoshiaki; Takeuchi, Toshio; Honda, Keijiro; Takahashi, Susumu; and Kinoda, Seiji, to Hitachi Chemical Company, Ltd. Process for developing or peeling alkali-type photosensitive film and apparatus used therein. 4,519,690, Cl. 354-324.000.

Tomita, Osamu: *See—*
Fujii, Yoshihiko; Tomita, Osamu; Taniguchi, Itaru; and Saiwai, Kazuhiko, 4,520,370, Cl. 346-76.00L.

Tomita, Seiji: *See—*
Yokoyama, Hideo; Tomita, Seiji; and Yamada, Shigeo, 4,519,558, Cl. 242-186.000.

Tomita, Seisuke: *See—*
Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, 4,519,431, Cl. 152-209 R.

Tomiyama, Tsuyoshi, to Kotobuki Seiyaku Co., Ltd. Farnesene derivatives, mucosal stabilizing compositions and method of manufacturing the same. 4,520,029, Cl. 514-479.000.

Tomlin, Jerry B.; Levey, Gustave S.; and O'Neil, Michael A., to Koomey, Inc. Seal for an underwater connector. 4,519,636, Cl. 285-95.000.
Tomy Kogyo Company, Incorporated: *See*—
Ajiro, Yutaka; and Kozuka, Michihiro, 4,519,788, Cl. 446-356.000.
Tonouchi, Akira: *See*—
Hara, Tomihiro; Adaniya, Takeshi; and Tonouchi, Akira, 4,519,878, Cl. 204-28.000.
Toon, John J. Process for blending fibers and textiles obtained from the fiber blends. 4,519,201, Cl. 57-252.000.
Topper International Enterprises: *See*—
Kinney, Roger D.; and Federowicz, Raymond J., 4,519,409, Cl. 135-88.000.
Tops, Martinus J.: *See*—
Van Rooy, Henricus J.; and Tops, Martinus J., 4,520,291, Cl. 313-365.000.
Toray Industries, Inc.: *See*—
Kato, Hiroyasu; Yagi, Kenkichi; and Okamoto, Miyoshi, 4,519,804, Cl. 8-485.000.
Torii, Yoshihiko; and Tochikubo, Osamu, to Kabushiki Kaisha Vine. Device for measuring a whole day urinary output. 4,519,248, Cl. 73-223.000.
Tosh, Douglas J., to Sternson Limited. Alkanolamine linked epoxy-urethanes. 4,520,185, Cl. 528-65.000.
Toshimitsu, Kenshi: *See*—
Kohyama, Mitsuaki; and Toshimitsu, Kenshi, 4,519,698, Cl. 355-15.000.
Toth, Dennis A., to Foster Wheeler Energy Corporation. Gas injection method for improving the operation of a fluidized bed reactor. 4,519,324, Cl. 110-347.000.
Toyama, Koji: *See*—
Tazuki, Shoji; and Toyama, Koji, 4,520,089, Cl. 430-49.000.
Toyo Rubber Chemical Industry Co., Ltd.: *See*—
Kumasaka, Sadao; and Tada, Satomi, 4,520,141, Cl. 521-126.000.
Toyo Seikan Kaisha Limited: *See*—
Kawaguchi, Kiyoshi; and Yamada, Muneki, 4,519,977, Cl. 264-550.000.
Toyo Soda Manufacturing Co., Ltd.: *See*—
Akazawa, Michihiro; and Kawasaki, Nobuhiro, 4,519,888, Cl. 204-252.000.
Toyoaki, Ishibachi; Minoru, Yoshihara; Takashi, Takuma; Yasunori, Fuke; and Masayuki, Maeda, to Furukawa Electric Co., Ltd., The; Kanto Denka Kogyo Co., Ltd.; and Fujidie Co., Ltd. Sintered high vanadium high speed steel and method of making same. 4,519,839, Cl. 75-242.000.
Toyoda, Kazuhiro: *See*—
Yamada, Katuyuki; and Toyoda, Kazuhiro, 4,520,462, Cl. 365-189.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Fujimura, Kazushiro; and Ito, Toshimitsu, 4,519,355, Cl. 123-491.000.
Hamada, Eiichi; and Hamada, Kouzou, 4,519,642, Cl. 292-247.000.
Hayashi, Kunihisa; and Nogami, Takahiro, 4,519,469, Cl. 180-169.000.
Imayoshi, Kiyoyuki, 4,519,123, Cl. 29-434.000.
Inui, Masaki, 4,519,264, Cl. 74-409.000.
Ito, Takaaki; and Kato, Takashi, 4,519,957, Cl. 261-44.00C.
Iwata, Minoru, 4,519,370, Cl. 123-432.000.
Katoh, Yuuichi; Matsuoka, Hiroki; and Iwata, Minoru, 4,519,354, Cl. 123-472.000.
Kawaguchi, Hiroshi; and Nishina, Shuho, 4,519,270, Cl. 74-535.000.
Terada, Takami; Nawa, Hiroshi; and Kawamura, Reiki, 4,519,650, Cl. 297-452.000.
Toyota Jidosha Kabushiki Kaishi: *See*—
Ito, Yoshiyasu; Kobayashi, Fumiaki; and Miyagi, Hideo, 4,519,353, Cl. 123-359.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
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Tsao, Thomas K. Golf putter. 4,519,612, Cl. 273-163.00R.
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Green, Jerry T.; and Beasley, Max M., 4,519,326, Cl. 112-79.00R.
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Gualtieri, Devlin M.; and Tumelty, Paul F., 4,520,460, Cl. 365-33.000.
Tunc, Deger C. Method of reducing nutrient absorption. 4,520,017, Cl. 514-54.000.
Tuot, James, to Nestec, S.A. Process for the preparation of foamed aromatization capsules and the capsules produced thereby. 4,520,033, Cl. 426-96.000.
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Kelly, Timothy A.; and Turbyfill, Rueben M., 4,519,645, Cl. 296-224.000.
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Pancook, James J.; and Ulbing, Otmar M., 4,520,247, Cl. 200-298.000.

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De Graw, Kenneth J.; Bocchini, William R.; Wilcockson, Brian; Bogossian, Armen; Ulh, Robert J.; Nause, Earl E.; and Ramirez, Ernest R., 4,519,103, Cl. 4-317.000.

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Coleman, Larry M.; and Tambo, William, 4,519,999, Cl. 423-337.000.
Harris, James E.; and Robeson, Lloyd M., 4,520,067, Cl. 428-323.000.
Jackson, John E.; Adler, Thomas A.; Quets, Jean M.; and Tucker, Robert C., Jr., 4,519,840, Cl. 106-1.050.
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Bertram, Rick V., 4,519,874, Cl. 201-39.000.

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Kinney, William L., Jr.; and Evans, Richard E., Jr., 4,519,823, Cl. 55-493.000.

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Norris, Michael A., 4,519,445, Cl. 165-76.000.

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Air Force: *See*—
Perry, John S., 4,520,364, Cl. 343-872.000.
Walker, Ronald P.; Rex, John D.; and Schummers, John H., 4,520,504, Cl. 382-1.000.
Army: *See*—
Arszman, Jerrold H., 4,519,315, Cl. 102-377.000.
Smith, Thomas V., 4,519,169, Cl. 51-241.00S.
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Potzick, James E.; and Robertson, Baldwin, 4,520,320, Cl. 328-133.000.
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Makiel, Joseph M., 4,520,082, Cl. 429-26.000.
Skotheim, Terji, 4,520,086, Cl. 429-192.000.
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Gallo, Robert C.; Popovic, Mikulas; and Sarngadharan, Mangalasseril G., 4,520,113, Cl. 436-504.000.
Knight, William A., III, 4,520,031, Cl. 514-632.000.
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Kuminecz, Jerome F.; and Lausten, Merlyn F., 4,519,545, Cl. 239-288.000.
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Lusk, Kenneth P., 4,520,428, Cl. 361-399.000.
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Tran, Danh C., 4,519,826, Cl. 65-3.110.

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Bolhuis, Pieter J., 4,520,295, Cl. 315-291.000.
Bukoschek, Romuald L.; and Diefenbach, Gerhard, 4,520,286, Cl. 310-83.000.
Grima, Jean-Claude; Pando, Bernard; and David, Guy A. J., 4,520,479, Cl. 370-84.000.
Jackson, Richard N.; and Tan, Sing L., 4,520,385, Cl. 358-12.000.
Morley, Peter; and Little, Peter J., 4,519,706, Cl. 356-319.000.
Schreiber, Peter; and Huth, Klaus, 4,520,496, Cl. 378-128.000.
Six, Jean-Claude G.; Claeys, Paul; and Guillaume, Michel, 4,519,771, Cl. 431-25.000.
te Velde, Ties S., 4,519,676, Cl. 350-269.000.
Van Rooy, Henricus J.; and Tops, Martinus J., 4,520,291, Cl. 313-365.000.
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United Technologies Corporation: *See*—
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Sutcliffe, John W., 4,519,732, Cl. 408-1.00R.
Wainauski, Harry S.; and Rohrbach, Carl, 4,519,746, Cl. 416-223.00R.

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Arai, Yoshihiro; and Tanaka, Takumi, 4,520,174, Cl. 525-438.000.
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University of California, The Regents of the: *See*—
Kado, Clarence I., 4,520,106, Cl. 435-172.300.

University of New Mexico: *See*—
Kirst, John A.; and Kutz, Daniel F., 4,520,503, Cl. 381-56.000.

University of Pennsylvania, Trustees of the: *See*—
Black, Jonathan; and Baranowski, Thomas J., Jr., 4,519,394, Cl. 128-419.00F.

University of Southern California: *See*—
Ho, Chih-Ming; and Gutmark, Ephraim, 4,519,423, Cl. 137-888.000.

UOP Inc.: *See*—
Arena, Blaise J., 4,520,122, Cl. 502-152.000.
Berg, Roy C.; Malloy, Thomas P.; and Vora, Bipin V., 4,520,218, Cl. 585-449.000.
Cleary, Michael T.; Kulprathipanja, Santi; and Neuzil, Richard W., 4,519,952, Cl. 260-419.000.
Ou, Di-Yi, 4,519,845, Cl. 127-46.200.
Qualeatti, Gail M.; and Arena, Blaise J., 4,519,951, Cl. 260-409.000.
Vora, Bipin V., 4,520,214, Cl. 585-254.000.

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Urai, Muneharu; Abe, Tadafumi; Haraguchi, Youichirou; Hayashi, Koji; and Kon, Shigeki, to Tachikawa Spring Co. Method of manufacturing cushion materials. 4,519,862, Cl. 156-219.000.

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Loev, Bernard; Jones, Howard; and Suh, John T., 4,520,131, Cl. 514-156.000.

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Arakawa, Miyao; Takenaka, Akihiko; Sato, Masahiro; Ohyama, Hideo; Utsumi, Hiroo; and Inoue, Shingo, 4,519,362, Cl. 123-414.000.

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Valentin, Ingo, to Applied Power Inc. Control system for a variable displacement pump. 4,519,752, Cl. 417-298.000.

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Renaud, Pierre, 4,519,488, Cl. 192-98.000.

van Blerk, Victor B.: *See*—
Mayer, Edward F.; and van Blerk, Victor B., 4,519,699, Cl. 355-15.000.

Van Buytene, Arend. Apparatus for utilizing the energy present in flowing water. 4,519,742, Cl. 415-7.000.

Van Cleave, George W.: *See*—
Barker, Robert B.; Davidge, Ronald V.; Gibson, David K.; and Van Cleave, George W., 4,519,700, Cl. 355-3.0SH.

Van Eenam, Donald N., to Monsanto Company. Polyetherene-polyacrylic polymerizable compositions. 4,520,184, Cl. 526-320.000.

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van Hekken, Frans; and Chen, Hsing-Yeo, to RCA Corporation. Cathode-ray tube having an asymmetric slot formed in a screen grid electrode of an inline electron gun. 4,520,292, Cl. 313-412.000.

Van Horn, Joseph M.: *See*—
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van Michaels, Christopher. Multi-fuel rotary power plants using gas pistons, elliptic compressors, internally cooled thermodynamic cycles and slurry type colloidal fuel from coal and charcoal. 4,519,206, Cl. 60-39.540.

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Varano, Vincent. Alarm system activated by buzzers. 4,520,349, Cl. 340-531.000.

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Vartanov, Albert A.: *See—*
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Seifert, Dieter; Muller, Harald; Muller, Lothar; Pestel, Karl; and Geissler, Helmut, 4,519,224, Cl. 69-30.000.

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Fuchs, Wilfried; Richter, Horst; Kober, Roland; Kaufmann, Vendelin; and Muller, Christina, 4,519,997, Cl. 423-265.000.

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Demus, Dietrich; Weissflog, Wolfgang; and Kresse, Horst, 4,519,936, Cl. 252-299.630.

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Kelly, Timothy A.; and Turbyfill, Rueben M., 4,519,645, Cl. 296-224.000.

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Vetter, David C.: *See—*
Montlick, Terry; Skoge, Klaus; Vetter, David C.; and Ahrens, Paul R., 4,520,499, Cl. 381-36.000.

Via, Francis A., to Stauffer Chemical Company. Sensitization of glyoxylate photoinitiators using a terphenyl compound. 4,519,883, Cl. 204-159.150.

Vickers, Incorporated: *See—*
Muller, Hans-Jurgen; and Krines, Hans-Gebhard, 4,519,572, Cl. 251-29.000.

Vickery, James D. Dry material sorting device. 4,519,896, Cl. 209-44.100.

Victor Company of Japan, Ltd.: *See—*
Kaneko, Kenji, 4,520,394, Cl. 358-150.000.
Sasaki, Akihiko; Arai, Kouji; Takashi, Takano; and Namiki, Yasuomi, 4,520,405, Cl. 360-10.300.
Sugiyama, Hiroyuki; Abe, Ryozo; Yusa, Yasuhiro; Sakurai, Masaki; and Yoshihara, Kenji, 4,520,473, Cl. 369-126.000.
Takahashi, Nobuaki; Takashima, Seiichi; Shibamoto, Takeshi; Suzuki, Fujio; Tanaka, Koji; Kubo, Mitsuo; Sugiyama, Hiroyuki; Amano, Yoshiaki; and Kikuchi, Mitsuru, 4,520,401, Cl. 358-310.000.

Victor, John G., to Institute of Gas Technology. Method for solvent recovery in solvent separation of ethanol from water. 4,520,213, Cl. 568-913.000.

Vilmur, Richard J., to Motorola, Inc. Duplex communication transceiver with modulation cancellation. 4,520,474, Cl. 370-24.000.

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Voepel, Harry W.: *See—*
Wang, David C.; and Voepel, Harry W., 4,520,287, Cl. 310-184.000.

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Mitchell, Bruce R.; and Vogel, Roger F., 4,520,120, Cl. 502-68.000.

Vogt, Karl H.: *See—*
Bradler, Hans J.; Brauner, Wilfried; Deyhle, Manfred; and Vogt, Karl H., 4,519,865, Cl. 156-256.000.

von Burg, Paul; Wirz, Armin; and Graf, Felix, to Rieter Machine Works, Ltd. Heatable godet. 4,519,778, Cl. 432-35.000.

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Berg, Roy C.; Malloy, Thomas P.; and Vora, Bipin V., 4,520,218, Cl. 585-449.000.

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Sychev, Anatoly P.; Sannikov, Jury I.; Grinin, Jury A.; Polyakov, Ivan P.; and Abdeev, Jury M., 4,519,836, Cl. 75-25.000.

VSP Labs, Inc.: *See—*
Velasquez, Juan F., 4,520,408, Cl. 360-51.000.

Vugts, Ludovicus, to U.S. Philips Corporation. Resistor. 4,520,342, Cl. 338-308.000.

Vultaggio, Anthony: *See—*
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W. C. Heraeus GmbH: *See—*
Aldinger, Fritz; Keilberth, Richard; and Werdecker, Waltraud, 4,519,966, Cl. 264-56.000.

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WABCO Fahrzeugbremsen GmbH: *See—*
Reinecke, Erich, 4,519,266, Cl. 74-471.0XY.

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Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,520,485, Cl. 372-48.000.

Wagenseil, Ludwig; and Hoffmeister, Hermann, to Hydromatik GmbH. Pressure averager. 4,519,413, Cl. 137-111.000.

Wagner, Bernd: *See—*
Strohmaier, Ernst; Reich, Heinrich; and Wagner, Bernd, 4,519,780, Cl. 433-29.000.

Wagner, Robert A., deceased: *See—*
Logan, Andrew H.; and Wagner, Robert A., deceased, 4,519,559, Cl. 244-17.170.

Wainauski, Harry S.; and Rohrbach, Carl, to United Technologies Corporation. Airfoil blade. 4,519,746, Cl. 416-223.00R.

Waitkus, Phillip A.: *See—*
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Walker, David G. Treatment of carbonaceous shales or sands to recover oil and pure carbon as products. 4,519,894, Cl. 208-11.00R.

Walker, Ernest D. Shellfish cutting and eating implement. 4,519,136, Cl. 30-142.000.

Walker, Michael L.: *See—*
Sutton, David L.; and Walker, Michael L., 4,519,922, Cl. 252-8.50B.

Walker, Ronald P.; Rex, John D.; and Schummers, John H., to United States of America, Air Force. Infrared system with computerized image display. 4,520,504, Cl. 382-1.000.

Walter, Bob. Adjustable ratio rocker arm. 4,519,345, Cl. 123-90.160.

Walter, John, to Continental Can Company, Inc. Tamper indicator for closure. 4,519,517, Cl. 215-253.000.

Walter, John: *See—*
Roth, Donald J.; Kubis, Charles S.; Walter, John; and Mohr, Glenn R., 4,519,859, Cl. 156-69.000.

Wang, David C.; and Voepel, Harry W., to Emerson Electric Co. Stator for a multiple-pole dynamoelectric machine and method of fabricating same. 4,520,287, Cl. 310-184.000.

Ward, Philip A., to Associated Electrical Industries Limited. Induction motors. 4,520,303, Cl. 318-778.000.

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Michalik, John K., 4,519,692, Cl. 354-412.000.

Warner & Swasey Company, The: *See—*
Hunter, James R.; and Lazzarotti, S. James, 4,519,284, Cl. 83-410.000.

Warwick, Dennis J.; Nubson, Richard C.; and Howes, Ronald B., Jr., to Data Card Corporation. Card feeding, transfer and output apparatus for an automatic embossing system. 4,519,600, Cl. 271-4.000.

Wasemann, William A., to White Consolidated Industries, Inc. Washing machine tub construction. 4,519,223, Cl. 68-23.500.

Waser, Rudolf: *See—*
Mast, Fred; and Waser, Rudolf, 4,519,682, Cl. 353-122.000.

Waste Recovery, Inc.: *See—*
Rouse, Michael W., 4,519,550, Cl. 241-167.000.

Watanabe, Junji, to Tokyo Shibaura Denki Kabushiki Kaisha. Sheet feeding apparatus. 4,519,601, Cl. 271-114.000.

Watanabe, Kazumasa: *See—*
Kobayashi, Tatsuhiko; Ikeuchi, Satoru; Watanabe, Kazumasa; and Suginaka, Shunji, 4,520,095, Cl. 430-223.000.

Watanabe, Kazuo; Ohkubo, Yuichi; Haeno, Akira; and Yokogawa, Fumihiko, to Hitachi, Ltd.; and Pioneer Electronic Corporation. Electronic impedance circuit including a compensation arrangement for d.c. offset. 4,520,282, Cl. 307-491.000.

Watanabe, Kunio: *See—*
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Watanabe, Mitsuru: *See—*
Ishihara, Masahiro; Watanabe, Mitsuru; Ohkawa, Shuji; Taguchi, Shunichi; and Kikuchi, Itsuo, 4,520,250, Cl. 219-10.55B.

Watanabe, Teruoki: *See—*
Nakanishi, Yasuo; Sakamoto, Kazunori; Ando, Giichi; and Watanabe, Teruoki, 4,519,854, Cl. 148-127.000.

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Watkins, Kenneth R.: *See—*
Randolph, Donald A.; and Watkins, Kenneth R., 4,520,073, Cl. 428-405.000.

Watson, Donald A.: *See—*
Hascal, Marcel; Watson, Donald A.; Danielski, Andrew; and Lopez, Sergio, 4,520,318, Cl. 324-457.000.

Watson, James M.; Butler, James R.; and Forward, Cleve H., to Cosden Technology, Inc. Alkylation of aromatics employing silicalite catalysts. 4,520,220, Cl. 585-467.000.

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Mittmann, Bernd, 4,519,772, Cl. 431-45.000.

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Galtz, Rudiger, 4,519,375, Cl. 126-110.00B.

Weber, Charles A.: *See—*
Weber, Randall W.; and Weber, Charles A., 4,519,677, Cl. 350-637.000.

Weber, Herbert, to Licentia Patent-Verwaltungs-GmbH. Method for determining the optimum sampling times for a QPSK or QAM received signal. 4,520,492, Cl. 375-86.000.

Weber, Kurt; Mondini, Giancarlo; and Mandl, Gerhard, to Rieter Machine Works, Ltd. Means for removing a layer of matted fibers from a filter drum. 4,519,821, Cl. 55-290.000.

Weber, Randall W.; and Weber, Charles A., to Bock Products, Inc. Power-operated vehicle mirror. 4,519,677, Cl. 350-637.000.

Webster, Emmett G.; and McLean, Kenneth W., to Sperry Corporation. Linkage for equalizing conditioning roll pressure. 4,519,188, Cl. 56-16.400.

Wei, Lee-Fang, to AT&T Information Systems Inc. Differentially nonlinear convolutional channel coding with expanded set of signalling alphabets. 4,520,490, Cl. 375-27.000.

Wei, Peter H. L., to American Home Products Corporation. α-Mercaptophenylacetic acid derivatives of imidazole-containing compounds and analogues thereof. 4,520,196, Cl. 544-285.000.

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Weiss, Arnold A.; and Gustafson, Dale A., to Weiss, Arnold A. High-voltage tire testing apparatus. 4,520,307, Cl. 324-54.000.

Weiss, Eugen: *See—*
Luitz, Max; and Weiss, Eugen, 4,519,625, Cl. 280-633.000.

Weiss, Kurt: *See—*
Dumbser, Gerhard; Lutz, Manfred; Fey, Rainer; and Weiss, Kurt, 4,519,227, Cl. 70-264.000.

Weiss, Richard: *See—*
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Weissflog, Wolfgang: *See—*
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Weitemeyer, Christian: *See—*
Fink, Hans-Ferdi; Kunzel, Gert; Klocker, Otto; Koerner, Gotz; Rossmy, Gerd; and Weitemeyer, Christian, 4,520,173, Cl. 525-403.000.

Weitman, Jacob. Method for heat recovery. 4,519,440, Cl. 165-1.000.

Weldon-Ming, Richard S. Collapsible support structures. 4,519,318, Cl. 108-33.000.

Wells, Bruce D.; and Ferguson, Du'Bois J., to Calgon Carbon Corporation. Use of activated carbon to remove dissolved organics from uranium leachate. 4,519,985, Cl. 423-6.000.

Wells, James E., III, to Elkem Metals Company. Apparatus and process for producing predominately iron alloy containing magnesium. 4,519,838, Cl. 75-129.000.

Wells, Wayne E., to Ford Motor Company. Axle clamp for filament reinforced synthetic material leaf springs. 4,519,590, Cl. 267-52.000.

Wen, Wilson K., to AT&T Bell Laboratories. Control information communication arrangement for a time division switching system. 4,520,477, Cl. 370-58.000.

Wende, Russell E.: *See—*
Caveney, Jack E.; Moody, Roy A.; Bulanda, John J.; and Wende, Russell E., 4,519,129, Cl. 29-749.000.

Werdecker, Waltraud: *See—*
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Werner, Eberhard: *See—*
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Weschenfelder, Otto T.; and Schmitt, Gunter K., to Koenig & Bauer Aktiengesellschaft. Former for a folder in a web-fed rotary printing press. 4,519,594, Cl. 270-20.100.

Wessely, Herrmann, to Siemens Aktiengesellschaft. Cooling subrack for logic cards. 4,520,426, Cl. 361-386.000.

West, C. Thomas: *See—*
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Westerman, Harry H., Jr., to RCA Corporation. Transfer apparatus for a record molding press. 4,519,767, Cl. 425-308.000.

Westinghouse Electric Corp.: *See—*
Abbondanti, Alberto, 4,520,298, Cl. 318-490.000.
Baker, Donal E., 4,520,319, Cl. 328-133.000.
Cameron, Frank L., 4,520,337, Cl. 337-275.000.
Down, Michael G., 4,519,837, Cl. 75-0.50B.
Kobuck, Richard M.; and Kalkbrenner, Ralph W., 4,519,593, Cl. 269-40.000.
Meuschke, Robert E.; Sherwood, Donald G.; and Silverblatt, Bernard L., 4,519,519, Cl. 220-211.000.
Rauch, Gary C.; and Krause, Robert F., 4,520,335, Cl. 336-212.000.
Riley, Robert F.; Meyer, Thomas I.; and Jordan, Wesley N., 4,519,662, Cl. 339-94.00R.
Sassano, Daniel R., 4,520,161, Cl. 525-11.000.
Seidel, Joseph, 4,519,425, Cl. 141-1.100.
Snedden, William H.; and Safiuddin, Mohammed, 4,520,450, Cl. 364-607.000.
Yannopoulos, Lymperios N.; Straw, Robert D.; and Philips, D. Colin, 4,520,157, Cl. 524-462.000.

Wetzel, Lawrence E. Air flow balancing fire damper. 4,519,301, Cl. 98-1.000.

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Knowles, John P.; Wheeler, Steven A.; and Mitchell, Stewart D., 4,519,726, Cl. 405-195.000.
Mitchell, Stewart D.; and Wheeler, Steven A., 4,519,727, Cl. 405-204.000.

Whelan, Patrick: *See—*
Fujioka, Futoshi; Boden, Richard M.; Schreiber, William L.; Whelan, Patrick; and Hanna, Marie R., 4,519,943, Cl. 252-522.00R.

White, Carl J. Method and apparatus for entrapment prevention and lateral guidance in passenger conveyor systems. 4,519,490, Cl. 198-333.000.

White Consolidated Industries, Inc.: *See—*
Wasemann, William A., 4,519,223, Cl. 68-23.500.

White, William P. Pin inserting machine. 4,519,534, Cl. 227-117.000.

Whitmore, Richard L. Paint-bucket holder. 4,519,565, Cl. 248-237.000.

Whittaker Corporation: *See—*
Holzrichter, Edward J.; and Smith, Marc L., 4,520,188, Cl. 528-274.000.

Whittington, Paul H.: *See—*
Campbell, Jesse L.; Fennema, Alan A.; Henderson, Robert B.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,519,553, Cl. 242-56.00R.

Whitwam, Ronald L., to Steelcase, Inc. Convertible inner shell for seating and the like. 4,519,651, Cl. 297-455.000.

Whyte, Lance; and Herweyer, Elliott E. Method and apparatus for magnetically treating fluids. 4,519,919, Cl. 210-695.000.

Wichterle, Otto, to Ceskoslovenska Adademie Ved. Soft lenticular contact lens with negative refraction. 4,519,681, Cl. 351-160.00H.

Wiech, Raymond E., Jr., to Fine Particle Technology Corporation. Substrate cooling. 4,519,447, Cl. 165-104.330.

Wiech, Raymond E., Jr., to Fine Particle Technology Corporation. Formation of narrow conductive paths on a substrate. 4,519,877, Cl. 204-15.000.

Wightman, William O., Jr.: *See—*
Campbell, Jesse L.; Fennema, Alan A.; Henderson, Robert B.; Rance, William G., Jr.; Whittington, Paul H.; and Wightman, William O., Jr., 4,519,553, Cl. 242-56.00R.

Wilcockson, Brian: *See—*
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Wilcox, Milton E.: *See—*
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Wiles, Laurence E.; and Page, Frank C., III, to Specialty Packaging Products, Inc. Means for mounting a closure in a predetermined position. 4,519,518, Cl. 215-331.000.

Wiley, Paul F., to Upjohn Company, The. Paulomycin derivatives. 4,520,191, Cl. 536-17.900.

Wilhelm Ruf KG: *See—*
Hoffmann, Horst, 4,520,228, Cl. 174-68.500.

Wilhelm Sihn Jr. KG.: *See—*
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Wilhelm, Stanley R.; and Spector, George. Lifetime livestock fence post. 4,519,586, Cl. 256-51.000.

Wilken, Rolf-Dieter: *See—*
Knochel, Arndt; Eggers, Ingo; Klatte, Bernd; and Wilken, Rolf-Dieter, 4,519,996, Cl. 423-249.000.

William H. Rorer, Inc.: *See—*
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Williams, Harvey A.: *See—*
Grabarski, David L.; and Williams, Harvey A., 4,519,276, Cl. 81-3.200.

Williams, Lanny J. Mechanical toy bull. 4,519,787, Cl. 446-313.000.

Williams, Robert L.; and Marks, Christopher, to Allied Corporation. Triaxial electrical connector. 4,519,666, Cl. 339-177.00R.

Williamson, Roger J.: *See—*
Pitt, Gillies D.; Williamson, Roger J.; Batchelder, David N.; and Prabakaran, Arulanandam M., 4,519,259, Cl. 73-861.220.

Willis, Horace E., Jr., to Merichem Company. Method for preparing elemental sulfur as a diffusion-resistant gas and methods for its use in making lime, sulfur dioxide and sulfuric acid from waste gypsum. 4,520,002, Cl. 423-522.000.

Willis, Stephen B.; and Boyce, Pamela J., to Dow Chemical Company, The. Modified polyalkylenepolyamines. 4,519,843, Cl. 106-90.000.

Willis, William M. Aircraft. 4,519,562, Cl. 244-207.000.

Wills, Robert P.; and Brooker, Andrew F., to Orthopedic Equipment Co. Inc. Distal locking intramedullary nail. 4,519,100, Cl. 3-1.900.

Wilson, James D. Nestable/stackable basket/tray combination for use in bakery goods distribution systems. 4,519,503, Cl. 206-505.000.

Wilson, Robert C., Jr.: *See—*
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Wilson, William J. Polygraphic encryption-decryption system. 4,520,232, Cl. 178-22.050.

Windmoller & Holscher: *See—*
Hornschuh, Manfred, 4,520,389, Cl. 358-107.000.

Winegeart, Mitchell E. Oil well safety valve for use with drill pipe. 4,519,576, Cl. 251-62.000.

Winter, Horst; and Eder, Erich, to Krones Aktiengesellschaft Hermann Kronseder Maschinenfabrik. Device for attaching tubular segments of plastic film on vessels. 4,519,186, Cl. 53-585.000.

Wirz, Armin: *See—*
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von Burg, Paul; Wirz, Armin; and Graf, Felix, 4,519,778, Cl. 432-35.000.

Wischniewski, Martin, to Deutsche Babcock Anlagen Aktiengesellschaft. Device for burning a coal-containing ash-rice sludge. 4,519,320, Cl. 110-238.000.

Witt, Alvin E., to PermaGrain Products, Inc. Stain-resistant earthen articles, grout and floor and wall surfaces composed thereof. 4,519,174, Cl. 52-389.000.

Witt, Reinhard: *See—*
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Wittkopf, Eugene W.; Jorgensen, Allen R.; and Daane, Robert A., to Magna-Graphics Corporation. Web surface treating apparatus. 4,519,757, Cl. 425-143.000.
Wittmer, Paul: *See—*
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Wolak, Ronald G., to Ford Motor Company. Temperature sensing structure for a furnace. 4,519,830, Cl. 65-162.000.
Wolcott, John H., to Eaton Corporation. Rolled housing for eddy current coupling. 4,520,284, Cl. 310-42.000.
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Wong, Alan S.: *See—*
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Wood, David C. Boat trailer. 4,519,738, Cl. 414-483.000.
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Woodruff, Seth D. Valve for control of fluid flow. 4,519,908, Cl. 210-287.000.
Worrall, James D.; and Tefft, Ronald E., to Engineered Yarns, Inc. Ionomer-coated yarns and their use in papermakers wet press felts. 4,520,059, Cl. 428-109.000.
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Wunschl, Nicholas H.; and Robinson, Edward L., Jr., to J. I. Case Company. Seed dispenser for planters. 4,519,525, Cl. 221-211.000.
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Xerox Corporation: *See—*
Badesha, Santokh S.; and Abkowitz, Martin A., 4,520,010, Cl. 427-83.000.
Crean, Peter A.; D'Ortenzio, Remo J.; and Grow, Carolyn P., 4,520,455, Cl. 364-900.000.
Ims, Dale R., 4,520,368, Cl. 346-75.000.
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Yagihashi, Shinichi: *See—*
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Yamada, Minoru; Ito, Eiji; and Nagai, Masaru, to Konishiroku Photo Industry Co., Ltd. Photographic taking lens driving means. 4,519,691, Cl. 354-400.000.
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Yamamoto, Nobuyuki; Nishikawa, Yasuo; Naruo, Kyoichi; and Okita, Tsutomu, to Fuji Photo Film Company Limited. Magnetic recording medium and process for producing same. 4,520,070, Cl. 428-336.000.
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Yamazaki, Hiroshi; and Tamaki, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Magnetic toner. 4,520,090, Cl. 430-106.600.
Yamazaki, Masami; and Shibata, Sueo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Method for assembling an impeller onto a turboshaft. 4,519,747, Cl. 416-244.00A.
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Yokomori, Iwao: *See—*
Ariyoshi, Hiromi; and Yokomori, Iwao, 4,520,420, Cl. 361-154.000.
Yokosawa, Tomoo, to Hidaka Seiki KK. Method of and apparatus for mounting plate fins of hairpin pipes. 4,519,121, Cl. 29-157.30C.

Yokoyama, Hideo; Tomita, Seiji; and Yamada, Shigeo, to Tokyo Shibaura Denki Kabushiki Kaisha. Tape player. 4,519,558, Cl. 242-186.000.

Yokoyama, Takashi: *See*—
Maeda, Yasuhiro; Yokoyama, Takashi; and Yagihashi, Shinichi, 4,519,764, Cl. 425-256.000.

Yokozeki, Seiki, to Matsushita Electric Industrial Co., Ltd. Method for operating a programmable microwave heating apparatus with food defrosting control. 4,520,251, Cl. 219-10.55M.

Yonezawa, Toshio: *See*—
Aoyama, Masaharu; Abe, Masahiro; Ajima, Takashi; and Yonezawa, Toshio, 4,520,041, Cl. 427-88.000.

Yoon, Heeyoung, to Conco Inc. Alcohol dissociation reactor for motor vehicles. 4,519,342, Cl. 123-3.000.

Yoshida, Iwao; Kasanami, Takeo; and Miura, Shuji, to Sanwa Kako Company Limited. Electroconductive cross-linked polyolefin foam and method for manufacture thereof. 4,519,963, Cl. 264-45.300.

Yoshida, Jituo; Okuyama, Shigeaki; and Suzuki, Hiroshi, to Kubota, Ltd. Fruit harvesting apparatus with television camera and monitor. 4,519,193, Cl. 56-328.00R.

Yoshida, Kasumi; Uchiki, Hideo; and Kuroishi, Tadafumi, to Hitachi, Ltd. Method for continuous flow analysis of liquid sample. 4,520,108, Cl. 436-52.000.

Yoshida, Kobun, to Pioneer Electronic Corporation. Autostop mechanism for tape recorder. 4,520,412, Cl. 360-96.100.

Yoshida, Shohei: *See*—
Takeuchi, Tatsuro; Yoshida, Shohei; and Kawai, Kazuhiro, 4,519,959, Cl. 261-93.000.

Yoshida, Susumu: *See*—
Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, 4,520,443, Cl. 364-424.000.

Yoshida, Takao: *See*—
Hall, John B.; and Yoshida, Takao, 4,520,032, Cl. 426-3.000.

Yoshida, Tomohisa: *See*—
Kamata, Nobuo; Sekiya, Takashi; Takeda, Kazutoshi; Hayasaka, Toyoo; and Yoshida, Tomohisa, 4,520,087, Cl. 429-219.000.

Yoshihara, Kenji: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Yusa, Yasuhiro; Sakurai, Masaki; and Yoshihara, Kenji, 4,520,473, Cl. 369-126.000.

Yoshii, Tetsuji, to Matsushita Electric Industrial Co., Ltd. Tape cassette. 4,519,521, Cl. 220-335.000.

Yoshii, Toshio; and Furukawa, Shigeyoshi, to Mitsubishi Denki Kabushiki Kaisha. On-load tap changer of the type of vacuum switches. 4,520,246, Cl. 200-144.00B.

Yoshikawa, Shozi; Kodama, Hiroshi; Ohsima, Ken; Sakamoto, Masaharu; Kato, Kiichi; and Yamamiya, Kunio, to Olympus Optical Company Limited. Apparatus for detecting input signal. 4,520,280, Cl. 307-358.000.

Yoshimura, Yoshito; Oshima, Noboru; Shimizu, Isamu; Yamaguchi, Shinsuke; Fujimaki, Tatsuo; Yamada, Tomoharu; and Tomita, Seisuke, to Bridgestone Tire Company Limited; and Japan Synthetic Rubber Co., Ltd. Styrene-butadiene copolymers with high styrene content. 4,519,431, Cl. 152-209.00R.

Yoshino, Akira; and Iwami, Isamu, to Asahi-Dow Limited. Heterogeneous system photosensitive oxidation sensitizer. 4,520,072, Cl. 428-403.000.

Yoshioka, Ryuzo: *See*—
Chibata, Ichiro; Yamada, Shigeki; Hongo, Chikara; and Yoshioka, Ryuzo, 4,519,955, Cl. 260-501.120.

Youle, Richard J.: *See*—
Neville, David M., Jr.; and Youle, Richard J., 4,520,011, Cl. 424-85.000.
Neville, David M., Jr.; and Youle, Richard J., 4,520,226, Cl. 424-85.000.

Young, Dennis L.: *See*—
Boeckman, Paul A.; and Young, Dennis L., 4,519,578, Cl. 251-163.000.

Young, William C.: *See*—
Curtis, Lyn; and Young, William C., 4,519,671, Cl. 350-96.150.

Yubakami, Keiichi: *See*—
Soga, Mamoru; Yubakami, Keiichi; Sonoda, Nobuo; and Shimotsuma, Wataru, 4,519,931, Cl. 252-62.510.

Yugenkaisha Hakusui Sangyo: *See*—
Kutsuna, Tomoharu; Ohtani, Shinzi; and Kondo, Kunimasa, 4,520,045, Cl. 427-294.000.

Yuki, Katsumi; Yoshida, Susumu; Ozeki, Mineo; Miyazaki, Yasuyuki; and Kawamata, Masaru, to Kabushiki Kaisha Toyoda Jidoh Shokki Seisakusho; and Kabushiki Kaisha Meidensha. Control device for loading and unloading mechanism. 4,520,443, Cl. 364-424.000.

Yusa, Yasuhiro: *See*—
Sugiyama, Hiroyuki; Abe, Ryozo; Yusa, Yasuhiro; Sakurai, Masaki; and Yoshihara, Kenji, 4,520,473, Cl. 369-126.000.

Zabrocki, Karl; Ott, Karl-Heinz; Schmidt, Adolf; and Pischtschan, Alfred, to Bayer Aktiengesellschaft. ABS-moulding compositions. 4,520,165, Cl. 525-84.000.

Zambon S.p.A.: *See*—
Della Bella, Davide; and Chiarino, Dario, 4,520,200, Cl. 548-247.000.

Zenith Electronics Corporation: *See*—
Cox, Charles M.; and Heuer, Charles, 4,520,392, Cl. 358-147.000.
Moon, Frederick H., 4,520,507, Cl. 455-3.000.

Zidon, Amicam C.: *See*—
Katz, Carlos; and Zidon, Amicam C., 4,519,759, Cl. 425-97.000.

Zillig, Robert G.: *See*—
Hoskins, John T.; and Zillig, Robert G., 4,519,449, Cl. 165-141.000.

Zincroksid S.p.A.: *See*—
Lavezzari, Carlo, 4,520,077, Cl. 428-632.000.

Zinser Textilmaschinen GmbH: *See*—
Hausner, Gerd; and Semmelrodt, Rolf, 4,519,202, Cl. 57-264.000.

Zoecon Corporation: *See*—
Kohn, Gustave K.; and Bamberg, Joe T., 4,520,199, Cl. 546-302.000.
Lee, Shy-Fuh, 4,520,197, Cl. 546-21.000.

Zot Manufacturing Company: *See*—
Lenhart, Richard D.; and Lindblad, Roger D., 4,519,609, Cl. 273-54.00A.

Zveguintzoff, Michel: *See*—
Boulle, Franck; and Zveguintzoff, Michel, 4,519,540, Cl. 237-7.000.

Zweig, Walter L.: *See*—
Boettcher, Charles W., Jr.; Hamilton, Billy H.; Slak, William M.; and Zweig, Walter L., 4,520,437, Cl. 363-41.000.

Zwick Energy Research Organization, Inc.: *See*—
Brigham, William D.; and Dung, Nguyen D., 4,519,213, Cl. 62-52.000.

Zwijsen, Wilhelmus A. J. M.; Duijndam, Cornelis P. J.; and Smeulers, Wouter, to U.S. Philips Corporation. Synchronizing circuit arrangement for deriving and processing a synchronizing signal contained in an incoming video signal. 4,520,393, Cl. 358-149.000.

Zylbert, Thaddeus J.; Fuhrmann, Wolf-Dieter; Hammer, Hans; and Kappertz, Fritz, to Singer Company, The. Sewing needle with two portion shank. 4,519,330, Cl. 112-222.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF MAY, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

American Cyanamid Company: *See*—
Halverson, Frederick, Re. 31,900, Cl. 210-734.000.

Ando, Yoshio: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

Goodyear Aerospace Corporation: *See*—
Suter, Charles A., Re. 31,898, Cl. 52-2.000.

Halverson, Frederick, to American Cyanamid Company. Process for the flocculation of suspended solids. Re. 31,900, Cl. 210-734.000.

Johnson, Dee Lynn, to Minnesota Mining and Manufacturing Company. Method for the alteration of a lens. Re. 31,897, Cl. 51-284.00R.

Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, to Pilot Man-Nen-Hitsu Kabushiki Kaisha; and Toyo Giken Kogyo Kabushiki Kaisha. Continuous electrolytical treatment of aluminum or its alloys. Re. 31,901, Cl. 204-28.000.

Minnesota Mining and Manufacturing Company: *See*—
Johnson, Dee Lynn, Re. 31,897, Cl. 51-284.00R.

Mizusawa, Masashi: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

Mochida, Haruo, to Nissan Motor Co., Ltd. Remote control arrangement. Re. 31,899, Cl. 292-8.000.

Nadkarni, Anil V., to SCM Corporation. Dispersion strengthened metals. Re. 31,902, Cl. 75-0.5BC.

Nissan Motor Co., Ltd.: *See*—
Mochida, Haruo, Re. 31,899, Cl. 292-8.000.

Pilot Man-Nen-Hitsu Kabushiki Kaisha: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

SCM Corporation: *See*—
Nadkarni, Anil V., Re. 31,902, Cl. 75-0.5BC.

Suter, Charles A., to Goodyear Aerospace Corporation. Inflatable-deflatable flexible structural component. Re. 31,898, Cl. 52-2.000.

Takahashi, Masaaki: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

Toyo Giken Kogyo Kabushiki Kaisha: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

Watanabe, Hiroshi: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

Yamagiwa, Yoichi: *See*—
Kawai, Satoshi; Yamagiwa, Yoichi; Mizusawa, Masashi; Watanabe, Hiroshi; Ando, Yoshio; and Takahashi, Masaaki, Re. 31,901, Cl. 204-28.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Allen, Herbert, to Hallen Company. Cork extractor. B1 4,291,597, 5-28-85, Cl. 81-3.480.

Bayer Aktiengesellschaft: *See*—
Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, B1 3,903,127, Cl. 260-453.0AB.

Berentzen, Hardo: *See*—
Mayer, Harald; and Berentzen, Hardo, B1 4,294,086, Cl. 66-121.000.

Daniel, Richard A.; and Geil, Ronald J., to Gould Inc. Microprocessor controlled micro-stepping chart drive. B1 4,377,847, 5-28-85, Cl. 364-400.000.

Eimer, Johannes: *See*—
Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, B1 3,903,127, Cl. 260-453.0AB.

Geil, Ronald J.: *See*—
Daniel, Richard A.; and Geil, Ronald J., B1 4,377,847, Cl. 364-400.000.

Gorton, Thomas S., Jr.: *See*—
Wenstrom, Richard T.; and Gorton, Thomas S., Jr., B1 3,665,554, Cl. 17-45.000.

Gould Inc.: *See*—
Daniel, Richard A.; and Geil, Ronald J., B1 4,377,847, Cl. 364-400.000.

Hallen Company: *See*—
Allen, Herbert, B1 4,291,597, Cl. 81-3.480.

Liebsch, Dietrich: *See*—
Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, B1 3,903,127, Cl. 260-453.0AB.

Mayer, Harald; and Berentzen, Hardo, to Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft. Latch needle for knitting machines. B1 4,294,086, 5-28-85, Cl. 66-121.000.

Nishizawa, Edward E.: *See*—
Rynbrandt, Ronald H.; and Nishizawa, Edward E., B1 4,168,315, Cl. 424-270.000.

Raab, Rainer: *See*—
Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, B1 3,903,127, Cl. 260-453.0AB.

Rynbrandt, Ronald H.; and Nishizawa, Edward E., to Upjohn Company, The. Novel dianisyl thiazole compound, compositions and method of antithrombotic treatment. B1 4,168,315, 5-28-85, Cl. 424-270.000.

Slade Gorton & Co., Inc.: *See*—
Wenstrom, Richard T.; and Gorton, Thomas S., Jr., B1 3,665,554, Cl. 17-45.000.

Theodor Groz & Sohne & Ernst Beckert Nadelfabrik Commandit-Gesellschaft: *See*—
Mayer, Harald; and Berentzen, Hardo, B1 4,294,086, Cl. 66-121.000.

Upjohn Company, The: *See*—
Rynbrandt, Ronald H.; and Nishizawa, Edward E., B1 4,168,315, Cl. 424-270.000.

Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, to Bayer Aktiengesellschaft. Process for the production of polyisocyanates with a biuret structure. B1 3,903,127, 5-28-85, Cl. 260-453.0AB.

Wenstrom, Richard T.; and Gorton, Thomas S., Jr., to Slade Gorton & Co., Inc. Method of eviscerating shellfish. B1 3,665,554, 5-28-85, Cl. 17-45.000.

Zirner, Joachim: *See*—
Wagner, Kuno; Eimer, Johannes; Zirner, Joachim; Raab, Rainer; and Liebsch, Dietrich, B1 3,903,127, Cl. 260-453.0AB.

LIST OF DESIGN PATENTEES

Acushnet Company: *See*—
Worster, John A.; Lyon, Herbert W.; Rambo, Charles D.; Santy, Arthur F.; and Foegen, M. Michael, 279,022, Cl. D21-220.000.

Advanced Plastics, Inc.: *See*—
Waters, John E., 278,995, Cl. D12-157.000.

Akiyama, Kunio, to Sharp Corporation. Personal computer. 279,009, 5-28-85, Cl. D14-106.000.

American Commercial, Incorporated: *See*—
Seibel, Ben, 278,962, Cl. D7-13.000.

American Cyanamid Company: *See*—
Harris, Ned, 278,973, Cl. D9-300.000.

Anaya, Randall C. Trowel. 278,966, 5-28-85, Cl. D8-10.000.

Anderson, Kirk S.; and Shane, Scott D., to Anderson Metals Corporation. Combined packaging and display container. 278,979, 5-28-85, Cl. D9-415.000.

Anderson Metals Corporation: *See*—
Anderson, Kirk S.; and Shane, Scott D., 278,979, Cl. D9-415.000.

Arcieri, Robert G. Housing for a waveguide feed for a parabolic dish antenna. 279,008, 5-28-85, Cl. D14-90.000.

Asoma Oy: *See*—
Soininen, Jarmo A., 278,949, Cl. D3-36.000.

AT&T Information Systems Inc.: *See*—
Ceradelli, Vittorio; Genaro, Donald M.; and Kelly, Thomas J., 279,010, Cl. D14-113.000.

AT&T Technologies, Inc.: *See*—
Genaro, Donald M.; Joffe, Richard M.; and McGarvey, John N., 279,005, Cl. D14-63.000.

Bauer, Harold F.: *See*—
Smith, Lloyd T.; Bauer, Harold F.; and Roth, Allen K., 278,971, Cl. D8-107.000.

Baumann, Gerhard. Receptacle for hydroponics. 278,989, 5-28-85, Cl. D11-152.000.

Berry, Richard D., Jr., to Design Institute America, Inc. Table. 278,959, 5-28-85, Cl. D6-480.000.

Biermann, P. J. Flexible pouring spout. 278,981, 5-28-85, Cl. D9-447.000.

Bolyn, Anthony E., to Congoleum Corporation. Display unit for samples of floor tiles, carpets or similar articles. 278,954, 5-28-85, Cl. D6-409.000.

Boudreaux, Mark D., to CPG Products Corp. Toy vehicle. 279,016, 5-28-85, Cl. D21-87.000.

Boudreaux, Mark D., to CPG Products Corp. Toy vehicle. 279,017, 5-28-85, Cl. D21-87.000.

Boudreaux, Mark D., to CPG Products Corp. Toy vehicle. 279,018, 5-28-85, Cl. D21-87.000.

Braswell, Ronald E. Fire extinguisher head assembly. 279,035, 5-28-85, Cl. D29-5.000.

Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, to Daimler-Benz Aktiengesellschaft. Automobile. 278,992, 5-28-85, Cl. D12-92.000.

Bridgestone Tire Company Limited: *See*—
Nishio, Hideaki; and Tateo, Yuji, 278,994, Cl. D12-137.000.

Brodie, Richard A. Font for musical symbols. 279,014, 5-28-85, Cl. D18-32.000.

Brown, Omar L.; Peters, Don B.; and Kalter, Jack L., to Fraze, Ermal C. End closure for a container. 278,980, 5-28-85, Cl. D9-438.000.

Brunner, Robert D.: *See*—
Empson, Edward H.; Brunner, Robert D.; and Fubershaw, Gerard A., 279,007, Cl. D14-113.000.

Burlington Basket Company: *See*—
Thompson, Cloud H., Jr., 279,038, Cl. D32-37.000.

Caton, Robert W.: *See*—
Eckstedt, Paul D.; and Caton, Robert W., 278,998, Cl. D13-35.000.

Ceradelli, Vittorio; Genaro, Donald M.; and Kelly, Thomas J., to AT&T Information Systems Inc. Video monitor. 279,010, 5-28-85, Cl. D14-113.000.

Chen, James, to Volta Industrial Co., Ltd. Thong sandal. 278,946, 5-28-85, Cl. D2-270.000.

Cheung, Kwok K., to Wai Hing Industrial Manufacturing Factory. Vanity mirror with hinged cover for attachment to the sun visor of an automobile. 278,996, 5-28-85, Cl. D12-191.000.

Colortran, Inc.: *See*—
Wolfe, Denis G.; Young, Thomas S.; Wasserman, Arnold S.; and Lawing, Edward, 278,997, Cl. D13-12.000.

Congoleum Corporation: *See*—
Bolyn, Anthony E., 278,954, Cl. D6-409.000.

Cornell, Samuel M.; and Goldstein, Robert B., to Goldstein, Robert B. Stuffed doll. 279,021, 5-28-85, Cl. D21-184.000.

Corning Glass Works: *See*—
Dair, Thomas M.; Stowell, Davin B.; and Viemeister, Tucker L., 278,963, Cl. D7-15.000.
Dair, Thomas M.; Stowell, Davin B.; and Viemeister, Tucker L., 278,964, Cl. D7-15.000.

Cousins, Morison, to International Mobile Machines Corp. Code attachment housing for a telephone stand. 279,003, 5-28-85, Cl. D14-60.000.

CPG Products Corp.: *See*—
Boudreaux, Mark D., 279,016, Cl. D21-87.000.
Boudreaux, Mark D., 279,017, Cl. D21-87.000.
Boudreaux, Mark D., 279,018, Cl. D21-87.000.

Daimler-Benz Aktiengesellschaft: *See*—
Breitschwerdt, Werner; van Winsen, Friedrich; and Sacco, Bruno, 278,992, Cl. D12-92.000.

Dair, Thomas M.; Stowell, Davin B.; and Viemeister, Tucker L., to Corning Glass Works. Drinking glass or the like. 278,963, 5-28-85, Cl. D7-15.000.

Dair, Thomas M.; Stowell, Davin B.; and Viemeister, Tucker L., to Corning Glass Works. Drinking glass or the like. 278,964, 5-28-85, Cl. D7-15.000.

Daynes, John C.: *See*—
Labuda, Lawrence L.; Linstad, Gregory A.; Jones, Paul W.; and Daynes, John C., 279,002, Cl. D14-6.000.

Design Institute America, Inc.: *See*—
Berry, Richard D., Jr., 278,959, Cl. D6-480.000.

Doerner, Frank. Chair control. 278,961, 5-28-85, Cl. D6-500.000.

Doman, Donald W.: *See*—
Kohler, Herbert V., Jr.; and Doman, Donald W., 279,028, Cl. D23-55.000.

Dorfman, Leonard M.: *See*—
Houlihan, John T.; and Dorfman, Leonard M., 278,986, Cl. D10-125.000.

Doyel, John S. Booklight. 279,032, 5-28-85, Cl. D26-60.000.

Eckstedt, Paul D.; and Caton, Robert W., to FMC Corporation. Pump monitor. 278,998, 5-28-85, Cl. D13-35.000.

Empson, Edward H.; Brunner, Robert D.; and Fubershaw, Gerard A., to Fortune Systems Corporation. Adjustable computer display and base. 279,007, 5-28-85, Cl. D14-113.000.

Farmer, James E., Sr. Cutlery sharpener. 278,968, 5-28-85, Cl. D8-91.000.

Fiskar Manufacturing Corporation: *See*—
Smith, Lloyd T.; Bauer, Harold F.; and Roth, Allen K., 278,971, Cl. D8-107.000.

Fletcher, Gary D.: *See*—
Ludwig, Joseph B., 279,036, Cl. D30-30.000.

Flototto, Reinhard-Heinrich. Cabinet. 278,957, 5-28-85, Cl. D6-432.000.

FMC Corporation: *See*—
Eckstedt, Paul D.; and Caton, Robert W., 278,998, Cl. D13-35.000.

Foam Tek, Inc.: *See*—
Ray, Sam W., 278,974, Cl. D9-305.000.

Foegen, M. Michael: *See*—
Worster, John A.; Lyon, Herbert W.; Rambo, Charles D.; Santy, Arthur F.; and Foegen, M. Michael, 279,022, Cl. D21-220.000.

Foldes, Steven M. Shoe and the like. 278,947, 5-28-85, Cl. D2-282.000.

Foldes, Steven M., to Fun Footwear, Co. Shoe and the like. 278,948, 5-28-85, Cl. D2-291.000.

Formelprodukter: *See*—
Nordgren, Peter; and Sjoholm, Hans, 279,024, Cl. D21-230.000.
Nordgren, Peter; and Sjoholm, Hans, 279,025, Cl. D21-230.000.
Nordgren, Peter; and Sjoholm, Hans, 279,026, Cl. D21-230.000.

Fortune Systems Corporation: *See*—
Empson, Edward H.; Brunner, Robert D.; and Fubershaw, Gerard A., 279,007, Cl. D14-113.000.

Franchi, Thomas A.; and Rogers, Leslie B., to Mobil Oil Corporation. Oil container. 278,977, 5-28-85, Cl. D9-383.000.

Franchi, Thomas A.; and Rogers, Leslie B., to Mobil Oil Corporation. Oil container. 278,978, 5-28-85, Cl. D9-383.000.

Fraze, Ermal C.: *See*—
Brown, Omar L.; Peters, Don B.; and Kalter, Jack L., 278,980, Cl. D9-438.000.

Fredriksson, Rune. Combined fastening bolt and locking washer therefor. 278,972, 5-28-85, Cl. D8-388.000.

Fubershaw, Gerard A.: *See*—
Empson, Edward H.; Brunner, Robert D.; and Fubershaw, Gerard A., 279,007, Cl. D14-113.000.

Fukasawa, Naoto; Suzuki, Susumu; and Uchihori, Noritaka, to Kabushiki Kaisha Suwa Seikosha. Portable television receiver. 279,006, 5-28-85, Cl. D14-77.000.

Fun Footwear, Co.: *See*—
Foldes, Steven M., 278,948, Cl. D2-291.000.

Genaro, Donald M.; Joffe, Richard M.; and McGarvey, John N., to AT&T Technologies, Inc. Housing for a telephone handset or similar article. 279,005, 5-28-85, Cl. D14-63.000.

Genaro, Donald M.: *See*—
Ceradelli, Vittorio; Genaro, Donald M.; and Kelly, Thomas J., 279,010, Cl. D14-113.000.

Gold Eagle Co.: *See*—
Gurolnick, William R., 278,975, Cl. D9-370.000.

Goldstein, Robert B.: *See*—
Cornell, Samuel M.; and Goldstein, Robert B., 279,021, Cl. D21-184.000.

Gordon, Arnold. Desk with built in computer console. 278,956, 5-28-85, Cl. D6-422.000.

Gurolnick, William R., to Gold Eagle Co. Bottle or similar article. 278,975, 5-28-85, Cl. D9-370.000.

Harris, Ned, to American Cyanamid Company. Combined bottle and cap. 278,973, 5-28-85, Cl. D9-300.000.

Henkels, Walter. Combined holder for writing instruments and note paper. 279,015, 5-28-85, Cl. D19-78.000.

Hewitt, Ronald, to Webb, Walter. Folding hatchet. 278,967, 5-28-85, Cl. D8-76.000.

Houlihan, John T.; and Dorfman, Leonard M., to Timex Corporation. Electro-optic display for a timepiece. 278,986, 5-28-85, Cl. D10-125.000.

Innovative Time Corporation: *See*—
Novak, Mickey E., 278,958, Cl. D6-471.000.

International Mobile Machines Corp.: *See*—
Cousins, Morison, 279,003, Cl. D14-60.000.
International Playtex, Inc.: *See*—
Stern, Harold; and Suleiman, Elisabeth, 278,945, Cl. D2-24.000.
Jennings, Don M. Clown doll. 279,020, 5-28-85, Cl. D21-173.000.
Joffe, Richard M.: *See*—
Genaro, Donald M.; Joffe, Richard M.; and McGarvey, John N., 279,005, Cl. D14-63.000.
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440 4,519,367
468 4,519,368
470 4,519,371
4,519,372
472 4,519,354
491 4,519,355
533 4,519,356
539 4,519,357
557 4,519,358
559 4,519,373
668 4,519,359

CLASS 124

23 R 4,519,374

CLASS 126

110 B 4,519,375
121 4,519,376
4,519,377
225 4,519,378
422 4,519,379
4,519,380
424 4,519,381
425 4,519,382
430 4,519,383
438 4,519,384

CLASS 127

46.2 4,519,845

CLASS 128

66 4,519,385
136 4,519,386
204.23 4,519,387
204.25 4,519,388
303.1 4,519,389
4,519,390
303.15 4,519,391
325 4,519,392
400 4,519,393
419 F 4,519,394
671 4,519,395
698 4,519,396
706 4,519,397
710 4,519,398
724 4,519,399
741 4,519,400
765 4,519,402
785 4,519,403
4,519,404

CLASS 131

94 4,519,405
4,519,406
291 4,519,407

CLASS 132

89 4,519,408

CLASS 134

15 4,519,846
28 4,519,847
34 4,519,848

CLASS 135

88 4,519,409
93 4,519,410

CLASS 137

68 R 4,519,411
72 4,519,412
111 4,519,413
246.22 4,519,414
318 4,519,415
488 4,519,416
501 4,519,417
571 4,519,418
596 4,519,419
4,519,420
596.16 4,519,421
630.14 4,519,422
888 4,519,423

CLASS 139

91 4,519,424

CLASS 141

1.1 4,519,425
5 4,519,426
65 4,519,427
98 4,519,428

CLASS 144

3 R 4,519,429

CLASS 148

1.5 4,519,849
4,519,850
6.31 4,519,851
16 4,519,852
16.5 4,519,853
127 4,519,854

CLASS 149

21 4,519,855

CLASS 152

209 R 4,519,430
4,519,431
357 A 4,519,432

CLASS 156

49 4,519,856
64 4,519,857
4,519,858
69 4,519,859
161 4,519,860
172 4,519,861

219 4,519,862
244.12 4,519,863
248 4,519,864
256 4,519,865
295 4,519,866
351 4,519,867
353 4,519,868
428 4,519,869
603 4,519,870
622 4,519,871
643 4,519,872

CLASS 160

126 4,519,433
133 4,519,434
166 A 4,519,435

CLASS 162

138 4,519,873

CLASS 164

120 4,519,436
284 4,519,437
415 4,519,438
476 4,519,439

CLASS 165

1 4,519,440
4,519,441
9.2 4,519,442
17 4,519,443
47 4,519,444
76 4,519,445
101 4,519,446
104.33 4,519,447
114 4,519,450
118 4,519,448
141 4,519,449

CLASS 166

278 4,519,451
288 4,519,452
303 4,519,453
4,519,454
305 R 4,519,455
312 4,519,456
317 4,519,457

CLASS 169

56 4,519,458

CLASS 172

42 4,519,459
176 4,519,460
225 4,519,461

CLASS 174

65 R 4,520,227
68.5 4,520,228
73 R 4,520,229
107 4,520,230
158 F 4,520,231

CLASS 175

53 4,519,462
61 4,519,463

CLASS 177

244 4,519,464

CLASS 178

22.05 4,520,232

CLASS 179

1.5 R 4,520,233
2 A 4,520,234
99 LS 4,520,235
107 E 4,520,236
115.5 ES 4,520,237
121 C 4,520,238

CLASS 180

6.48 4,519,465
7.1 4,519,466
8.5 4,519,468
68.4 4,519,467
169 4,519,469
180 4,519,470
219 4,519,471
227 4,519,472
229 4,519,473
279 4,519,474

CLASS 182

17 4,519,475
28 4,519,476
107 4,519,477
178 4,519,478

CLASS 187

29 R 4,519,479

CLASS 188

52 4,519,480
322.17 4,519,481
343 4,519,482

CLASS 191

12.4 4,520,239

CLASS 192

0.033 4,519,485
3 S 4,519,486
3.58 4,519,484
4 A 4,519,483
36 4,519,487
98 4,519,488

CLASS 193

31 R 4,519,489

CLASS 198

333 4,519,490
349 4,519,491
408 4,519,492
414 4,519,493
448 4,519,494
486 4,519,495
676 4,519,496

CLASS 200

5 B 4,520,241
5 R 4,520,240
6 A 4,520,242
51.07 4,520,243
67 DA 4,520,244
82 R 4,520,245
144 B 4,520,246
298 4,520,247
340 4,520,248

CLASS 201

39 4,519,874

CLASS 203

28 4,519,875

CLASS 204

15 4,519,876
4,519,877
28 Re.31,901
4,519,878
35.1 4,519,879
91 4,519,880
149 4,519,881
158 R 4,519,882
159.15 4,519,883
181 C 4,519,884
192 R 4,519,885
196 4,519,886
212 4,519,887
252 4,519,888
275 4,519,889
409 4,519,890
418 4,519,891

CLASS 206

37 4,519,497
214 4,519,498
219 4,519,499
223 4,519,892
311 4,519,893
312 4,519,500
339 4,519,501
390 4,519,502
505 4,519,503
554 4,519,504

CLASS 208

8 LE 4,519,895
11 R 4,519,894
74 4,519,897
131 4,519,898
179 4,519,899
254 H 4,519,900
321 4,519,901

CLASS 209

44.1 4,519,896
234 4,519,902
513 4,519,505
592 4,519,506
682 4,519,507

CLASS 210

94 4,519,903
167 4,519,904
198.2 4,519,905
223 4,519,906
257.1 4,519,907
287 4,519,908
327 4,519,910
478 4,519,911
500.2 4,519,909
611 4,519,912
4,519,913
633 4,519,914
663 4,519,915
678 4,519,916
4,519,917
680 4,519,918
695 4,519,919
701 4,519,920
716 4,519,921
734 Re.31,900

CLASS 211

59.2 4,519,508
119.13 4,519,509
131 4,519,510
187 4,519,511
193 4,519,512

CLASS 215

32 4,519,513
225 4,519,514
230 4,519,515
252 4,519,516
253 4,519,517
331 4,519,518

CLASS 217

69 W 4,520,253

CLASS 219

10.49 R 4,520,249
10.55 B 4,520,250
10.55 M 4,520,251
69 M 4,520,252
121 L 4,520,254
130.1 4,520,255
225 4,520,256
250 4,520,257
279 4,520,258
501 4,520,259
553 4,520,260

CLASS 220

211 4,519,519
263 4,519,520
335 4,519,521

CLASS 221

13 4,519,522
129 4,519,523
167 4,519,524
211 4,519,525

CLASS 222

212 4,519,526
383 4,519,527
396 4,519,528
484 4,519,529
494 4,519,530

CLASS 223

30 4,519,531

CLASS 227

8 4,519,532
109 4,519,533
117 4,519,534
131 4,519,535
147 4,519,536

CLASS 228

221 4,519,537

CLASS 229

27 4,519,538

CLASS 236

13 4,519,539

CLASS 237

7 4,519,540

CLASS 239

1 4,519,541
4,519,542
265.19 4,519,543
279 4,519,544
288 4,519,545
542 4,519,546
585 4,519,547
652 4,519,548
703 4,519,549

CLASS 241

167 4,519,550
194 4,519,551

CLASS 242

7.17 4,519,552
56 R 4,519,553
67.4 4,519,554
107.2 4,519,555
117 4,519,556
118.31 4,519,557
186 4,519,558

CLASS 244

17.17 4,519,559
45 R 4,519,560
110 B 4,519,561
207 4,519,562
208 4,519,563

CLASS 248

58 4,519,564
237 4,519,565
360 4,519,566

CLASS 249

57 4,519,567
66 R 4,519,568
142 4,519,569
194 4,519,570

CLASS 250

203 R 4,520,261
221 4,520,262
223 R 4,520,263
311 4,520,264
338 4,520,265
357.1 4,520,266
358.1 4,520,267
492.1 4,520,268
492.2 4,520,269
560 4,520,270

CLASS 251

1 A 4,519,571
29 4,519,572
30 4,519,573
31 4,519,574
58 4,519,575
62 4,519,576
4,519,577
163 4,519,578
172 4,519,579
223 4,519,580
268 4,519,581
328 4,519,582
4,519,583

CLASS 252

8.5 B 4,519,922
8.5 C 4,519,923
35 4,519,924
48.6 4,519,925
49.6 4,519,926
4,519,927
50 4,519,928
51.5 A 4,519,929
62.2 4,519,930
62.51 4,519,931
73 4,519,932
140 4,519,933
174.12 4,519,934
299.1 4,519,935
299.63 4,519,936
500 4,519,937
4,519,938
4,519,939
4,519,940
514 4,519,941
520 4,519,942
522 R 4,519,943
4,519,944

CLASS 254

29 R 4,519,584
273 4,519,585

CLASS 256

51 4,519,586

CLASS 260

119 4,519,945
239.55 R 4,519,946
371 4,519,947
396 R 4,519,948
397.1 4,519,949
404 4,519,950
409 4,519,951
419 4,519,952
453 AB B1 3,903,127
465 H 4,519,953
465.8 D 4,519,954
501.12 4,519,955
549 4,519,956

CLASS 261

44 C 4,519,957
50 A 4,519,958
93 4,519,959
94 4,519,960

CLASS 264

4.6 4,519,961
40.7 4,519,962
45.3 4,519,963
45.4 4,519,964
51 4,519,965
56 4,519,966
86 4,519,967
178 R 4,519,968
210.7 4,519,969
245 4,519,972
261 4,519,970
267 4,519,973
279 4,519,974
311 4,519,971
526 4,519,975
540 4,519,976
550 4,519,977

CLASS 266

80 4,519,587
220 4,519,588

CLASS 267

52 4,519,589
4,519,590
148 4,519,591

CLASS 269

25 4,519,592
40 4,519,593

CLASS 270

20.1 4,519,594
31 4,519,595
32 4,519,596
42 4,519,597
53 4,519,598
4,519,599

CLASS 271

4 4,519,600
114 4,519,601

CLASS 272

33 R 4,519,602
73 4,519,603
4,519,604
116 4,519,605

CLASS 273

1 R 4,519,606
5 B 4,519,607
29 A 4,519,608
54 A 4,519,609
89 4,519,610
126 R 4,519,611
163 R 4,519,612
417 4,519,613

CLASS 277

84 4,519,614
92 4,519,615
152 4,519,616
153 4,519,617
228 4,519,618
235 B 4,519,619

CLASS 279

2 R 4,519,620
116 4,519,621

CLASS 280

33.99 S 4,519,622
461 A 4,519,623
633 4,519,624
4,519,625
661 4,519,626
701 4,519,627
4,519,628

CLASS 281

25 A 4,519,629
31 4,519,630

CLASS 283

70 4,519,631
75 4,519,632

CLASS 285

3 4,519,633
55 4,519,634
93 4,519,635
95 4,519,636
113 4,519,637
305 4,519,638
415 4,519,639

CLASS 290

38 C 4,520,271
40 A 4,520,272
54 4,520,273

CLASS 292

8 Re.31,899
33 4,519,640
127 4,519,641
247 4,519,642

CLASS 294

19.1 4,519,643

CLASS 296

136 4,519,644
224 4,519,645

CLASS 297

15 4,519,646
85 4,519,647
146 4,519,648
316 4,519,649
452 4,519,650
455 4,519,651
477 4,519,652

CLASS 303

89 4,519,653

CLASS 305

27 4,519,654

CLASS 307

39 4,520,274
64 4,520,275
228 4,520,276
252 C 4,520,277
253 4,520,278
254 4,520,279
358 4,520,280
475 4,520,281
491 4,520,282
520 4,520,283

CLASS 310

42 4,520,284
83 4,520,285
4,520,286
184 4,520,287
194 4,520,288
316 4,520,289

CLASS 312

12 4,519,655
256 4,519,656

CLASS 313

15 4,520,290
365 4,520,291
412 4,520,292

CLASS 315

5.25 4,520,293
50 4,520,294
291 4,520,295

CLASS 318

254 4,520,296
490 4,520,297
4,520,298
587 4,520,299
603 4,520,300
609 4,520,301
696 4,520,302
778 4,520,303
800 4,520,304

CLASS 322

2 R 4,520,305

CLASS 323

324 4,520,306

CLASS 324

54 4,520,307
58.5 R 4,520,308
73 R 4,520,309
115 4,520,310
117 R 4,520,311
158 D 4,520,312
158 P 4,520,314
158 R 4,520,313
309 4,520,315
4,520,316
326 4,520,317
457 4,520,318

CLASS 328

133 4,520,319
4,520,320
4,520,321

CLASS 330

263 4,520,322
268 4,520,323
285 4,520,324
302 4,520,325

CLASS 331

116 R 4,520,326
177 R 4,520,327

CLASS 332

31 T 4,520,328

CLASS 333

135 4,520,329
195 4,520,330

CLASS 335

125 4,520,331
126 4,520,332
129 4,520,333
186 4,520,334

CLASS 336

212 4,520,335

CLASS 337

140 4,520,336
275 4,520,337
297 4,520,338

CLASS 338

5 4,520,339
35 4,520,341
195 4,520,340

308 4,520,342

CLASS 339

15 4,519,657
17 CF 4,519,658
59 M 4,519,659
75 M 4,519,660
89 M 4,519,661
94 R 4,519,662
99 R 4,519,663
143 R 4,519,664
147 R 4,519,665
177 R 4,519,666
186 M 4,519,667
241 4,519,668
274 4,519,669

CLASS 340

19 R 4,520,343
58 4,520,344
309.2 4,520,345
347 DD 4,520,346
4,520,347
508 4,520,348
531 4,520,349
569 4,520,350
574 4,520,351
590 4,520,352
636 4,520,353
679 4,520,354
709 4,520,355
750 4,520,356
783 4,520,357
799 4,520,358
870.19 4,520,359
947 4,520,360

CLASS 343

361 4,520,362
372 4,520,361
828 4,520,363
872 4,520,364
903 4,520,365

CLASS 346

1.1 4,520,366
75 4,520,367
4,520,368
4,520,369
76 L 4,520,370
76 PH 4,520,371
136 4,520,372
140 R 4,520,373
4,520,374
4,520,375
204 4,520,376
208 4,520,377
209 4,520,378
214 4,520,379

CLASS 350

96.15 4,519,670
4,519,671
96.20 4,519,672
96.32 4,519,673
102 4,519,674
259 4,519,675
269 4,519,676
338 4,519,678
339 R 4,519,679
486 4,519,680
637 4,519,677

CLASS 351

160 H 4,519,681

CLASS 353

122 4,519,682

CLASS 354

127.11 4,519,683
145.1 4,519,684
154 4,519,685
200 4,519,686
202 4,519,687
297 4,519,688
304 4,519,689
324 4,519,690
400 4,519,691
412 4,519,692

CLASS 355

3 DD 4,519,693
3 SH 4,519,700
5 4,519,694
14 D 4,519,696
14 R 4,519,695
4,519,697
15 4,519,698
4,519,699
39 4,519,701
51 4,519,702
69 4,519,703

CLASS 356

73.1 4,519,704
138 4,519,705
319 4,519,706
326 4,519,707
350 4,519,708
373 4,519,709
411 4,519,710

CLASS 357

2 4,520,380
30 4,520,381
53 4,520,382
81 4,520,383
82 4,520,384

CLASS 358

12 4,520,385
13 4,520,386
90 4,520,387
107 4,520,388
4,520,389
108 4,520,390
133 4,520,391
147 4,520,392
149 4,520,393
150 4,520,394
163 4,520,395
167 4,520,396
168 4,520,397
183 4,520,398
287 4,520,399
296 4,520,400
310 4,520,401
324 4,520,402
332 4,520,403
335 4,520,404

CLASS 360

10.3 4,520,405
14.2 4,520,406
32 4,520,407
51 4,520,408
59 4,520,409
77 4,520,410
85 4,520,411
96.1 4,520,412
113 4,520,413
125 4,520,414
137 4,520,415

CLASS 361

11 4,520,416
45 4,520,417
92 4,520,418
104 4,520,419
154 4,520,420
234 4,520,421
305 4,520,422
380 4,520,423
383 4,520,424
384 4,520,425
386 4,520,426
389 4,520,427
399 4,520,428
413 4,520,429
433 4,520,430

CLASS 362

180 4,520,431
267 4,520,432
296 4,520,433
309 4,520,434
311 4,520,435
366 4,520,436

CLASS 363

41 4,520,437
98 4,520,438

CLASS 364

200 4,520,439
4,520,440
4,520,441
400 B1 4,377,847
414 4,520,442
424 4,520,443
426 4,520,444
450 4,520,445
468 4,520,446
478 4,520,447
488 4,520,448
559 4,520,449
607 4,520,450
900 4,520,451
4,520,452
4,520,453
4,520,454
4,520,455
4,520,456
4,520,457
4,520,458

CLASS 365

15 4,520,459
33 4,520,460
184 4,520,461
189 4,520,462
4,520,463
4,520,464
203 4,520,465
210 4,520,466

CLASS 366

4 4,519,711
77 4,519,712
79 4,519,713
285 4,519,714
343 4,519,715

CLASS 367

24 4,520,467
83 4,520,468

CLASS 369

44 4,520,469
72 4,520,470
112 4,520,471
4,520,472
126 4,520,473

CLASS 370

24 4,520,474
4,520,475
32 4,520,476
58 4,520,477
63 4,520,478
84 4,520,479
100 4,520,480

CLASS 371

37 4,520,481
68 4,520,482
4,520,483

CLASS 372

24 4,520,484
48 4,520,485
95 4,520,486

CLASS 373

134 4,520,487

CLASS 374

8 4,519,716
17 4,519,717
45 4,519,718

CLASS 375

5 4,520,488
14 4,520,489
27 4,520,490
4,520,491
86 4,520,492
97 4,520,493

CLASS 376

307 4,519,978

CLASS 378

108 4,520,494
117 4,520,495
128 4,520,496
166 4,520,497

CLASS 381

16 4,520,498
36 4,520,499
43 4,520,500
48 4,520,501
51 4,520,502
56 4,520,503

CLASS 382

1 4,520,504
55 4,520,505
56 4,520,506

CLASS 384

94 4,519,719

CLASS 400

241 4,519,720
472 4,519,721

CLASS 403

26 4,519,722
33 4,519,723
345 4,519,724

CLASS 405

195 4,519,725
4,519,726
204 4,519,727
224 4,519,728
258 4,519,729
4,519,730

CLASS 407

46 4,519,731

CLASS 408

1 R 4,519,732

CLASS 409

7 4,519,733
231 4,519,734

CLASS 411

65 4,519,735
361 4,519,736

CLASS 414

71 4,519,740
337 4,519,737
483 4,519,738
724 4,519,739
738 4,519,741

CLASS 415

7 4,519,742
92 4,519,744

CLASS 416

1 4,519,743
96 A 4,519,745
223 R 4,519,746
244 A 4,519,747

CLASS 417

45 4,519,748
158 4,519,749
270 4,519,750
298 4,519,752
322 4,519,751
403 4,519,753
477 4,519,754

CLASS 418

9 4,519,755
68 4,519,756

CLASS 420

448 4,519,979
474 4,519,980

CLASS 422

64 4,519,981
68 4,519,982
78 4,519,983
196 4,519,984

CLASS 423

6 4,519,985
19 4,519,986
60 4,519,987
76 4,519,988
121 4,519,989
210 4,519,990
220 4,519,991
230 4,519,992
235 4,519,993
242 4,519,994
244 4,519,995
249 4,519,996
265 4,519,997
277 4,519,998
332 4,520,001
337 4,519,999
456 4,520,000
522 4,520,002
531 4,520,006
533 4,520,003
598 4,520,004
599 4,520,005

CLASS 424

17 4,520,007
47 4,520,008
78 4,520,009
85 4,520,011
4,520,226
95 4,520,012
141 4,520,013
153 4,520,014
4,520,015
195.1 4,520,019
197.1 4,520,020
270 B1 4,168,315

CLASS 425

6 4,519,758
97 4,519,759
113 4,519,760
135 4,519,761
143 4,519,757
183 4,519,762
192 R 4,519,763
256 4,519,764
263 4,519,765
302.1 4,519,766
308 4,519,767
456 4,519,768

CLASS 426

3 4,520,032
96 4,520,033
4,520,034
128 4,520,035
271 4,520,036
330.6 4,520,037

CLASS 427

26 4,520,038
35 4,520,039
38 4,520,040
83 4,520,010
88 4,520,041
209 4,520,042
239 4,520,043
244 4,520,044
294 4,520,045
304 4,520,046
331 4,520,047
350 4,520,048
356 4,520,049
381 4,520,050
387 4,520,051
443.1 4,520,052

CLASS 428

31 4,520,053
35 4,520,054
55 4,520,055
68 4,520,056
4,520,057
90 4,520,058
109 4,520,059
131 4,520,060
137 4,520,061
148 4,520,062
195 4,520,063
199 4,520,064
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	138	278,953
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	409	278,954
	422	278,956
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	480	278,959
	491	278,960
	500	278,961
D7—	13	278,962
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	91	278,968
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	438	278,980
	447	278,981
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	125	278,986
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	125	278,988
	152	278,989
	155	278,990
	162	278,991
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	129	278,993
	137	278,994
	157	278,995
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	113	279,007
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	155	279,029
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DESIGN PATENTS

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12 : 5,479

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